

MIT OpenCourseWare
<http://ocw.mit.edu>

6.931 Development of Inventions and Creative Ideas
Spring 2008

For information about citing these materials or our Terms of Use, visit: <http://ocw.mit.edu/terms>.

CREATE OR PERISH
The Case for Inventions and Patents

ROBERT H. RINES
Rines and Rines
Boston, Massachusetts
Lecturer, Department of Electrical Engineering
Massachusetts Institute of Technology
Cambridge, Massachusetts

PRELIMINARY EDITION
Transcribed for MIT OpenCourseWare
<http://ocw.mit.edu>

CREATE OR PERISH
The Case for Inventions and Patents

CONTENTS

Introduction	1
1 The Origin and Development of The American Patent System	5
1.1 Conclusion	13
2 The Role of the Patent Office and the Courts	15
2.1 The Nature of the Patent Office	15
2.2 Patent Office Problems	18
2.3 Review of Patent Office Decisions	19
2.4 The Present Mood of the Courts	20
2.5 The Reports of Patent Office and Court Decisions	22
2.6 A Further Role of the Courts – Infringement Suits	23
3 The Patent Law	27
3.1 Classes of Patentable Invention	27
3.2 Conditions of Patentability	31
3.3 Interference	35
3.4 The Statutory Test of Invention	36
3.5 Obviousness of “Subject Matter as a Whole”	39
3.6 Statutory Presumption of Validity of a Patent	42
3.7 Commentary–Legal Recognition of Inventions	43
4 Patents in Action (History of the Basic Telephone Patent)	47
4.1 The Circumstances Underlying Bell’s Invention	47
4.2 Bell’s Basic Patent	49
4.3 The Founding of Bell’s Company – and the Pirates	51
4.4 Enters the Supreme Court	54
4.5 How Would Our Supreme Court React to Bell’s Patent?	63
5 The Rights, Obligations, and Problems of Inventors	65
5.1 University and Government Relations	69
5.2 Current Governmental Agency Regulations Concerning Patents	71
5.3 Industrial Employment Agreements	73
5.4 The Problems and Dangers in Negotiation	75
5.5 Professor Cady Was Not Alone	82

5.6	Conclusion	85
6	The Future of American Patents	89
6.1	Previous Suggested Improvements in the Patent System	89
6.2	The Search	90
6.3	Opposition Proceedings	91
6.4	Technically Trained Tribunals	94
6.5	Are Today's Patents Worth Saving?	97
6.6	What is Wrong	103
6.7	The Task	108
7	The Modernization of Patent Systems	113
7.1	Present Proposals for a Common European Patent and Judiciary	114
7.2	Some Different Ideas for Revision of the American Patent System	118
8	Court Modernization for Aiding the Patent System and the Law	125
8.1	The Nature of the Criticism	125
8.2	A Few Measures Already Proposed	129
8.3	A Different Proposal	130
8.4	Conclusion	131
9	A Formula for Economic Decline	133
9.1	The Pity of Serendipity	133
9.2	"Mind-Forged Manacles"	134
9.3	"Conformity Is a Psychotic State"	135
9.4	Mental Containers	135
9.5	The Degree Slide Rule Won't Work This Time	136
9.6	A New Use for Senior Scientific Statesmen	137
9.7	Create or Perish	137

LIST OF FIGURES

1.1	The first United States Patent Grant, July 31, 1790.	12
4.1	Part of Bell's original telephone patent.	50
4.2	A part of Elisha Gray's caveat.	54
4.3	Bourseul's make-and-break concept.	59
4.4	Philip Reis's construction.	60
5.1	Cady's patent drawing.	77
5.2	A part of Nicolson's original patent.	80
5.3	A part of Pierce's patent.	87
6.1	Interest of the United States Supreme Court in patents.	111

CREATE OR PERISH
The Case for Inventions and Patents

INTRODUCTION

The American patent system needs no apologists. Though it may not be entirely suited in all respects to our current problems and needs, and though sometimes it may have been misused, its record of achievement in the progress of our country is indelibly written on the pages of history. Its current service, despite the fact that it is not being fully utilized in the second half of the century, seems to me equally indisputable; though some critics without firsthand experience in this field may not agree. Those critics are free to write their own books.

I have undertaken to write mine as a champion of the philosophy that today, as much as ever, incentives that make a person fight to be an individual promote the welfare the whole state. In my lectures, many of which have been included in this book, I frankly paint a picture, particularly for engineers and applied scientists, that is based on this philosophy and thus supports patents¹

But invention, patents, and innovation cannot be treated apart from their social, political, and economic environment, despite mechanistic courses given in law schools. Thus, to review the principles of patent law without delving into the interplay of many aspects of our society would be to discuss a theoretical, nonexistent system. This book, therefore, is not addressed solely to engineers and applied scientists; some parts are addressed to lawyers, economists, businessmen, and politicians.

I have found the problem of presenting all facets so that they may be understood by readers of quite varied disciplines to be not without difficulty. For this reason illustrations have been confined to technology that can readily be comprehended by nontechnicians, and legal and economic discussions have been kept sufficiently elementary to be grasped at least in part by the technical reader, but without sacrificing the point intended for the legalist or economist.

Those who expect an engineering “cookbook” approach to this subject will not find it here. Similarly, those who look for a presentation in the form of a Procrustean “case study” will be equally disappointed.

To write an interdisciplinary book requires a mixture of interdisciplinary techniques, and so I have tried to interweave history, primary principles, procedures, problems, and points of conflict into what I believe to be the true fabric pattern of the patent system, struggling to stay alive in a world of rapid change. Because of this somewhat unorthodox approach, I have summarized the scope

¹Gordon McKay Lectures on Patent Law, given at Harvard University, 1956-58.

of each chapter at its head, and, in some cases, the reason for the approach used in order that the reader may better understand my mode or presentation.

In Chapter 1, a survey of the origin and historical background of the American patent system is presented; and, at its conclusion, serious questions are raised as to whether that system is currently either effectively performing its original historical purposes or meeting the requirements of the present. I hope that by the end of the book, the reader may have gained an insight into some of the answers to these questions.

Chapter 2 reviews the role of the Patent Office and the courts in administration of the patent laws, especially for the benefit of those unfamiliar with the administrative details of patent application prosecution and judicial review.

The statutory provisions of American patent law are discussed in Chapter 3, with reference to actual cases interpreted and decided by the courts. While the classes of patentable inventions and the conditions of patentability can be readily agreed upon, there is widespread conflict as to the standard set by the 1952 Patent Act to determine what is “invention” and what is “obvious.” I have, accordingly, devoted a section of this chapter to discussing this conflict, giving my own views – predicated upon what I feel is in the national interest, namely an interpretation that encourages the independent American inventor and his backers as well as corporate inventors. In this connection the chapter concludes with statistics offered by leading independent inventors pointing up their vital *current* contributions to technology and the necessity for liberal and sympathetic legal recognition of their work if the *independent* inventor is not to disappear from the American scene.

In Chapter 4, I have carried forward an illustrative approach found most effective in lecturing: tying together the complete picture of innovation – from the conception and invention stage, through financial backing and development, entrepreneuring, business formation, and legal contests with pirates. Here I have used the medium of the Bell Telephone Cases, because this outdated invention involves technology and a degree of importance familiar to all readers, and because almost everything that could happen did happen to Bell, except the anonymity experienced by many current inventors from which he was saved by a single vote in the Supreme Court.

Strongly woven through the fabric of the invention-innovation cycle are the relations between inventor and employer and between inventor and potential user or licensee. These include typical industrial, university, and governmental contract provisions. Since inventions are frequently stolen, the pitfalls facing the inventor are reviewed in Chapter 5. There are, however, very few proven cases of such piracy, and so I have selected a previously little-known example (in the field of piezoelectricity) that took over two decades to document and establish by legal decision. The publication of this exposure, it is hoped, may forewarn the inventor, and perhaps give second thoughts to business and governmental agencies in the matter of trying to circumvent the proprietary position of inventors.

Chapter 6 discusses critically recent proposals for improving the patent system, including current conflicting views in Congress and the courts as to gov-

ernment rights in patents and other matters.

I have left to Chapter 7 a consideration of the exciting modernization program being planned by the European Economic Community with the view of providing a single common European patent and law of patents. The possible effect of this upon the American system is noted, and some of my own views with regard to possible immediate improvements in the administration of our system are presented.

Though one of expected primary groups of readers of this book is the engineering profession, the solution to current problems in the protection of inventions and patents calls for more than mere engineering consideration. There is a decided, and even primary, legal side concerning which something must be said. In Chapter 8, therefore, I have supplemented Chapter 7's technical suggestions for Patent Office and administrative improvement with proposals for modernizing judicial review. I have tried to formulate these in language that engineers can follow, but without losing their force for the legal and quasi-legal professionals.

Chapter 9 points up the general economic consequences of the above problems.

If in the end I am considered to have been too harsh on the courts of our land, my answer must be that my position is based on more than mere academic study. My attack is considered, deliberate, and to me necessary. My plea is simple. Before it is too late, let us restore to the individual his importance and dignity, and recognize and protect the fruits of his mind. A dynamic society led by free and encouraged creative minds – with government back in its role of servant and partner – offers the Free World's best hope.

CHAPTER 1

THE ORIGIN AND DEVELOPMENT OF THE AMERICAN PATENT SYSTEM

This chapter presents a survey of the historical background of the American patent system and, at its conclusion, raises serious questions as to whether that system is currently either performing effectively the original historical purposes or meeting the needs of the present.

“Oysters stuffed with honey” may sound like a gastronomic nightmare. To the authorities of the Greek colony of Sybaris ¹, some five hundred years before Christ, however, it may well have been “an unusual and peculiar dish” that no one had the right to prepare and serve for a one-year period but the cook who originated it.

This official invitation to indigestion is one of the earliest recorded instances of a grant paralleling somewhat our concept of a patent granted for an invention. The policy of grants of numerous kinds by the state to individuals who had deserved well at its hands was inherited by medieval Europe from early times. Rome, for example, had rewarded her military heroes with triumphal processions, and had parceled out to them her conquered lands, upon which they might levy taxes. English monarchs exercised the prerogative of granting a right, franchise, charter, commission, office, monopoly, or the like – for example, a title of nobility or permission to explore the New World. They did so in each case through the medium of a document addressed “To all to whom these presents shall come,” an *open* document termed “Litterae Patentes” or Letters Patent – letters openly recorded in the Patent Rolls.

That the English king had good reason for granting at least some kinds of letters patent, under proper circumstances, can be understood from the following considerations. Medieval Europe was a barbarous or semibarbarous territory, not far removed from savagery. Industry and trade were in a precarious condition. The nobles, not only in England but also on the Continent, as

¹*Athenaeus; The Deipnosophists* (3 Vols.), C. D. Yonge, Ed. , Bohn’s Classical Library, 1854, p. 835.

rulers supreme in their particular domains, demanded tolls from all who passed through their territories. They could do this uncontrolled by their supposedly superior monarchs, by fortifying themselves on hillsides and other places of advantage. Not until the invention of gunpowder were these monarchs able to bring their nobles under subjection.

The trade of those days was conducted by merchants who traveled from country to country through the domains of various nobles. Because the merchants were subjected to great expense and risk in the carrying on of their business, they were compelled to charge very high prices for the goods that they introduced for sale in Europe. Many articles were expensive luxuries beyond the reach of all but the very wealthiest.

The Crusades, beginning in the eleventh century A.D. and continuing for several centuries more, brought the Europeans into contact with the Saracens, at that time a comparatively highly cultured people. They had developed the arts and were skilled in such sciences as algebra and astronomy, the very word "algebra" coming from the Arabic.

Upon returning to their homes, the Crusaders carried with them much that they had found in the East, including knowledge of various arts and industries. Italian city-states, such as Genoa and Venice, the most powerful groups of their day, developed as a direct result of their proximity to the East. They prospered because of the trade that they had built up between the East and the West. In order to have something to sell, in return for the goods they obtained in the East, they stimulated new arts and industries by granting monopolies to favored individuals who were willing to take the risks involved. Early grants are reported for grain mills, and in 1474 the Venetian Senate voted the first of all patent laws applying to all classes of invention. This law forbade infringement for a term of ten years, but gave free access to the government, provided that the latter dealt with the inventor and did not permit others to employ the invention in the government's behalf ².

To protect their trade and the industries they had established, European merchants banded together for common defense organized their own armies and navies. During the late Middle Ages they became quite powerful, as the Hanseatic League attests. Not until several centuries later, when new trade routes were opened up after the discovery of the New World, were the Italian city-states reduced to their present status as subdivisions of a larger nation.

But the Italian cities were not the only communities thus benefited. The goods and skills germinated by this trade with the East gradually spread over the whole of Europe. Because England was the farthest west and physically separated from the continent, it was not in the most favored position to secure these advantages, which the other states often guarded jealously. To overcome these disadvantages the English monarchs adopted the continental practice of granting patents, usually to foreigners, giving them for limited periods of time

²This statement is based on information given me by some British patent lawyers who remembered hearing a paper entitled, "The Early History of Patents for Invention," given by M. Frumian before the Chartered Institute of Patent Agents in England sometime in the 1930's.

the exclusive right to carry on such new industries as, in consideration of the grant, they agreed to import into the realm.

In this way the cloth industry was introduced into England. In 1331, Edward III granted a patent to John Kempe of Flanders, weaver of woolen cloth, and in 1336 to Brabant weavers. In 1440, one was issued to John of Shiedame to enable him to import a newly invented process of manufacturing salt³. The Tudors, successors of Edward IV, attracted skilled foreign artisans by negotiations – German armorers, Italian shipwrights, Normandy glassmakers, and French iron workers⁴.

Patents were also given to individuals and companies for other services to the state, to induce them to embark upon commercial or other ventures involving risk. Among these were the East India Trading Company, chartered by Queen Elizabeth I, and the Hudson's Bay Company, still very much a commercial force in Canada, chartered by her immediate successor.

In the then relatively undeveloped state of industry and commerce, patents of this nature were undoubtedly necessary for the good of the realm and the well-being of its subjects. The objects sought thereby were: first, domestic supply of foreign, high-priced goods which would reduce their cost and consequently encourage their wider use; and, secondly, employment for English workmen in the new industries thus established. Some of the patents, indeed, specifically provided that English apprentices be employed.

Gomme, late librarian of the British Patent Office⁵, for example, quotes from the 1449 patent granted by Henry VI to John of Utynam, "...to instruct divers lieges of the crown in the art of making colored glass." It is reported⁶ that the precipitating cause of this patent grant was the requirement for colored windows at Eton College.

Much later, the Court of King's Bench clearly enunciated the rationale of such patents:

But if a man hath brought in a new invention and a new trade within the Kingdom, in peril of his life, and consumption of his estate or stock . . . or if a man hath made a new discovery of anything, in such cases the King . . . in recompense of his costs and travail, may grant by charter unto him, that he only shall use such a trade or trafique for a certain time, because at first the people of the Kingdom are ignorant, and have not the knowledge or skill to use it⁷.

But beneficent measures are frequently attended by abuses. In granting their patents, the English kings did not always consider whether or not these conferred benefits upon their subjects.

The latter's revolt against King John at Runnymede, in 1215, resulted in the famous Magna Carta. The monarch there had to agree that merchants were

³A. A. Gomme, *Patents of Invention*, Longmans Green and Co., 1946, p. 12

⁴*Journal of the Patent Office Society*, Vol. 18, pp. 21ff. (1936).

⁵A. A. Gomme, *Patents of Invention*, p. 12

⁶H. Hardin, *Patent Office Centenary*, Her Majesty's Stationery Office, 1953, pp. 21, 34.

⁷78 Eng. Rep. 148 (*Clothworkers of Ipswich*, King's Bench, 1615).

not to be prohibited from engaging in trade, “if they were not openly prohibited before.” This suggests no upsetting of current patents in trade, but restrictions on the monarch’s power to grant further patents in existing trades.

The Magna Carta was not the only contract that the English kings made with their subjects. History shows, however, that the monarchs regarded these agreements much as some nations today regard treaties. When, under force of circumstances, kings were compelled to submit to greater force, as in the case of John at Runnymede, they signed anything that was put before them; but, as soon as the danger was over, they forgot their promises and acted as though they had never given them.

In their endeavors to raise money, to reward favorites, and for other reasons, succeeding English monarchs thus granted many patents that became burdensome to the people. One person would be given the exclusive right to engage in a certain industry, such as tanning; another to trade in soap, salt, starch, saltpeter, leather, paper or glass; another to buy and sell iron or steel; and still another to import certain articles; and so on. Sometimes the monopoly covered trade in all England; at other times, the sale of a particular article in a particular region. As the activities so monopolized had previously been free to the public, the only result was to raise prices which must be paid by the many, that the favored patentees might be enriched.

In the fall of 1601, in response to protests, Queen Elizabeth I proclaimed that if any of her subjects felt aggrieved or wronged by reason of any of these patent grants, he could test the validity of the patent in the Court of Queen’s Bench. The very next spring, 1602, one Edward D’Arcy brought suit for infringement of his patent grant for making and importing playing cards. The justification for the patent grant had been based upon grounds of public policy, that unless the grant existed subjects who might better “go to plow did employ themselves in the art of making cards⁸.” This is the famous Case of Monopolies. Though the court held the monopoly on playing cards to be invalid, the case has come down the ages as recognizing the existence of something most important, namely the line of division between what is proper and what is improper subject matter for a patent “monopoly.” To quote from the decision,

Where any man by his own charge and industry or by his own wit or invention doth bring any new trade into the Realm of any Engine tending to the furtherance of a trade that never was used before; And that for the good of the Realm; That in such cases the King may grant to him a monopoly patent for some reasonable time until the subjects may learn the same, in consideration of the good that he doth bring by his Invention to the Commonwealth; otherwise not.

This has been the law in England up to the present time. One can still obtain a patent in Great Britain, not merely for an invention that he has made, but also for a new article or idea imported from outside the realm.

⁸*D’Arcy v. Allen*, 11 Coke 86 (1602), known as the Case of Monopolies.

Notwithstanding the D'Arcy decision, the very next monarch, James I, who ascended the throne in 1603, granted more monopolies than ever, including some for silk and even inns. The cry against harmful monopolies in Great Britain accordingly grew in vigor, until, finally, by the Statute of Monopolies in 1623, Parliament deprived the sovereign completely of this prerogative.

The Statute of Monopolies made an exception, however, in favor of patents for inventions – the very same exception that the judges had indicated in the D'Arcy case, and which was really, in effect, declaratory of the common law, i. e., that no special privilege would be granted for “... any letters patent and grants of privilege for the term of fourteen years or under hereafter to be made of the sole working or making of any manner of new manufacture within this Realm to the true and first inventor and inventors of such manufactures which other at the time of making of such letters patent and grants shall not use so as also they be not contrary to the law nor mischievous to the State by raising prices of commodities at home or hurt of trade or generally inconvenient⁹.”

Both the English and the American laws of patents¹⁰ come directly from this exception for inventions, and the very provision quoted above still exists as Section 6 of the present British Statute of Monopolies.

The American colonists were fully acquainted with patents, and knew their value under certain circumstances, as set forth in the Statute of Monopolies. Like the mother country, several of the colonies, prior to the Constitutional Convention, had granted patents in the endeavor to introduce industries. The patents were not necessarily for new inventions, but sometimes for old industries, if brought in from abroad, and also for fostering those struggling for survival. The encouragement of industries was achieved not only by the grant of monopolies in special enactments of the local legislature, corresponding to the English grants from the Crown, but also through the medium of premiums, bounties, and the like.

Fully aware, when granting these perquisites, of the monopolistic evils in the country whence they had come, the colonists took precautions against a repetition of those evils. For example, the Massachusetts General Court (the colonial legislature) in 1641 enacted that “There shall be no monopolies granted or allowed among us, but of such new inventions as are profitable to the country, and that for a short time.” Connecticut had a similar provision. Massachusetts, Connecticut, Virginia, South Carolina, New York, and other colonies granted a number of patents covering different methods of making salt, some invented and others imported, and sometimes on condition that saltworks be established within a limited time. Similar patents covering the exclusive manufacture of other articles, and often on similar conditions, were granted by the colonists. These included the manufacture of iron and of machinery, a sawmill, a grain mill, and a tobacco pipe factory.

The first patent granted by the Massachusetts General Court, pursuant to the enactment of 1641, was one to Samuel Winslow (1641) for a novel method

⁹*Statute of Monopolies*, 21 Jac. I, C.3 (1623).

¹⁰*Kendall v. Winsor*, 21 How. 322, 327, 328; *Motion Picture Co. v. Universal Film Co.*, 243 U.S. 502, 510, 511.

of making salt. The first machinery patent granted by the same body was to Joseph Jenkes, in 1646, for a scythe-manufacturing mill. In 1667, Massachusetts offered a fifteen-year monopoly to anyone who would build a dry dock, and, the offer apparently not proving sufficiently attractive, the term of years was increased in the following year to twenty-one. Several of the colonies continued to grant patents, even after they became states upon the adoption of the Constitution. New York, for example, issued one to Livingston and Fulton covering the exclusive right to operate steamboats in New York waters, a patent later annulled by Chief Justice Marshall as being in violation of the interstate-commerce clause of the Constitution.

The delegates to the Constitutional Convention in 1787, fully familiar with all the circumstances, desired to provide the new nation with the benefits of a patent system. Both James Madison of Virginia and Charles Pinckney of South Carolina, therefore, proposed that Congress be given certain powers in that direction. Madison's proposal was that it should have power: "To secure to literary authors their copyrights for a limited time. To encourage by *premiums* and *provisions*, the advance of useful knowledge and discoveries."

Parenthetically, the Atomic Energy Commission is doing the very thing today that Madison suggested so long ago¹¹. Certain types of inventions dealing with the production of fissionable material and atomic weapons cannot be patented under the exclusion provisions of the Atomic Energy Act. An inventor may, however, make a claim for remuneration for his contribution, and, under certain standards that have been set up, may be awarded a sum of money by the Commission. From a study of the unclassified awards and experience with the AEC, some authorities believe that the Constitutional founders were most wise in rejecting Madison's proposal. They are convinced that the failure of the nuclear program to get off the ground more rapidly and extensively, in the way and to the same degree that our free-enterprise inventive efforts with other nongovernment-controlled programs have historically blossomed for the common good, may be due, in part, to the inadequacy of this kind of so-called incentive.

Charles Pinckney disliked Madison's proposal that the government should evaluate and pay out sums of money for inventions. His own proposal was that Congress should have the power "to *grant patents* for useful inventions. To secure to authors exclusive rights for a certain time." Under this concept, the competitive industrial marketplace would determine the value of an invention.

As it emerged from committee and as adopted by the Convention, the Constitution provided, and still provides, in Article I, Section 8, that Congress shall have power: "To promote the Progress of Science and Useful Arts, by securing for limited Times to Authors and Inventors the exclusive Right to their respective Writings and Discoveries."

Pursuant to this provision, Congress could have granted to a person who makes a scientific discovery the exclusive right to his own discovery. The Con-

¹¹42 U.S.C. 2187 (Sec. 157). (The abbreviation U.S.C. refers to the United States Code – a collected body of federal law.)

stitution uses the words “Science,” “exclusive right,” “discoveries ¹².” As will be made evident, however, Congress has provided for exclusive rights only in cases of certain kinds of advances and not for scientific discoveries per se.

This provision is the only one in the whole Constitution which relates to the creation of private property rights and was intended to promote the progress of science and the useful arts. It rested on the great tradition and philosophy of our capitalistic system – the granting of limited protection to the individual in developing ideas for the benefit of the many.

Nothing, it will be noted, is said in this provision about granting patents as such. The word “securing” is used instead. Madison later explained, in the Federalist papers, that, though the word “securing” was appropriate only in connection with copyrights, which had been recognized as a natural property right at common law, there was no reason why the same principles should not apply to inventions: “The right to useful inventions seems with equal reason to belong to the inventors. The public seems with equal reason to belong to the inventors. The public good fully coincides in both cases with the claims of individuals.”

Jefferson, however, declined to accept the view that inventions belonged to inventors as a natural right. He felt that they were for the benefit of the whole society.

After the adoption of the Constitution, President Washington recommended legislation in furtherance of this constitutional provision, and a statute was enacted by the very first Congress, in 1790. The founders of the Union thought the matter so important that they provided therein that the Secretary of State (Thomas Jefferson), in collaboration with the Secretary of War (Henry Knox of Massachusetts) and the Attorney General (Edmund Randolph of Virginia), should examine all patent applications, and the President and the Secretary of State should personally sign the patent grant. That body of three eminent men, Jefferson, Knox, and Randolph, in effect constituted the first Patent Office of this country, with Jefferson the first patent examiner, commissioner, and lawyer. Washington, Jefferson, and Randolph signed the first patents.

Jefferson, though, opposed to all forms of monopoly, and at first including patents in this category, was compelled as a result of his experience to state that the patent law gave “a spring to invention beyond my conception,” and that, therefore, “nobody wishes more that I that ingenuity should receive a liberal encouragement¹³.”

Before a patent could be issued under the law of 1790, it was necessary that the application be carefully examined to determine whether the purported invention, in the terms of the statute, was “before known or used” and whether it was really “sufficiently useful and important” to warrant the dignity of a patent

¹²There is a great doubt whether this word “Science” as used in the Constitution, meant what we mean today. My own study leads me to the conviction that the term “science” in the constitutional sense, was used, rather, with philosophical and literary concepts primarily in mind.

¹³In a letter to Oliver Evans, May 2, 1807, as given in *The Writings of Thomas Jefferson*, A. E. Bergh, Ed., 1907, Vol. 5, p. 74.

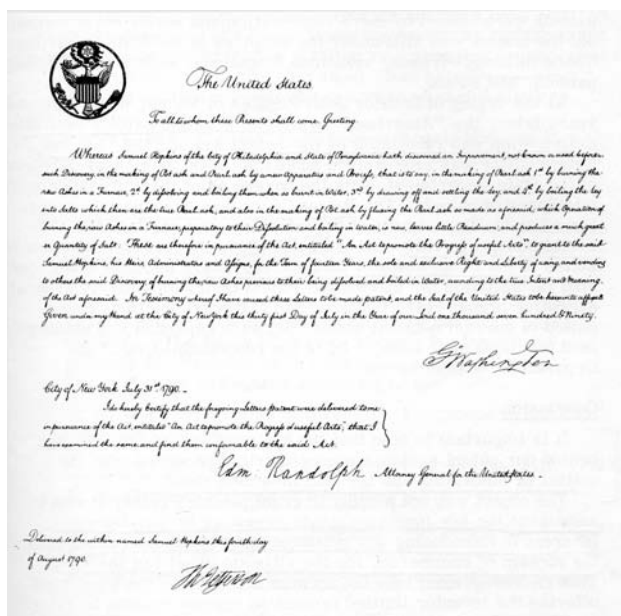


Fig. 1.1: The first United States Patent Grant, July 31, 1790 (Reproduced from the original in the collection of the Chicago Historical Society. This image is public domain and is not protected by copyright.)

grant. Before three years had elapsed, however, the “sufficiently useful and important” condition was removed from the statute, and patents were issued by mere registration and not by examination; but the matter was still under the auspices of the State Department. Chaos followed – frauds, vexatious litigations, multiple conflicting patents, and so on.

At the urging of Senator John Ruggles of Maine, some forty-odd year later, the “American” system of granting patents only after examination was reinstated by the Patent Act of 1836, and the Patent Office was reorganized and established as a separate bureau of the State Department, with the bureau chief formally titled commissioner of patents. The Patent Office was subsequently transferred to the Department of the Interior, upon the latter’s establishment in 1849; and later, in 1926, it was given its present status in the Department of Commerce. There has long been, and still is, agitation for making the Patent Office an entirely separate executive branch¹⁴, perhaps with expanded functions more suited to current national needs. But such expanded and modernized functions still seem to fit in the responsibilities of the Department of Commerce.

¹⁴ *Journal of the Patent Office Society*, Vol. 40, pp. 10 - 17 (1958).

1.1 Conclusion

It is important to note that the historical purposes that lay behind our patent system were primarily concerned with the matter of *innovation* and not bald invention alone.

The object was not merely to grant patents; rather it was to encourage the few inventive minds among us to take the risks inherent in introducing new products and arts or processes into the stream of commerce, for the ultimate benefit of the many. This encouragement took the form of a contract: the sovereign offering the inventor limited protection against copying in return for the publication of the details of his invention; and it rested upon the theory, now ironically applied more effectively by the Soviets than by us, that rewards to the individual benefit the public at large.

An additional purpose was to prevent, through the publication of inventions in patents, a recurrence of loss of arts such as had happened formerly when knowledge was handed down from father to son secretly.

But whether today's patent system in America, its administration and its treatment by the judiciary, is an effective stimulus to innovation, has become a question of the utmost importance and urgency.

Does the system offer that kind of security to the inventor and his backers that stimulates ready embarkation upon the risky road of innovation?

Do its rewards stimulate the myriad engineers who, as a condition of their employment in much of industry and government, have assigned to their employers all their rights to any inventions they may make?

Has its use in certain large corporate quarters been reduced largely to defensive and cross-licensing needs, as distinguished from protecting an exclusive position as a stimulus to innovation?

Are we today really worried about "lost arts"?

Does the system promote the progress of useful military, nuclear, and space arts?

In short, has our patent system been largely reduced in many fields to the granting of papers with red seals – mostly form and little substance?

CHAPTER 2

THE ROLE OF THE PATENT OFFICE AND THE COURTS

For the benefit of readers unfamiliar with the details of patent application prosecution and judicial review, the role of the Patent Office and courts is herein summarized.

In view of the multiple-function purpose of this book and diversity of backgrounds of its hoped-for readers, a brief review is in order of the processes involved in filing and prosecuting patent applications in the Patent Office and the role of the courts of the land in patent litigation. This chapter, obviously, will be of little interest for those knowledgeable in this field.

Perhaps an interesting way to trace the procedure would be to stand in the shoes of an imaginary independent inventor in the first flush of success in the completion of an invention. In order to obtain a patent for it, he must submit for examination by the Patent Office a detailed description that, by law, must be in a certain subscribed form and be couched in legal terminology generally quite foreign to those who produce inventions as well as to nonlegal persons in general. The patent application itself must contain a clear and concise description of the invention (termed here the specification), usually with reference to drawings illustrating a preferred form of the device, and a set of succinct terminal paragraphs, called claims, setting forth the features of novelty which the inventor and his attorney believe the Patent Office should allow as defining the scope of the patent grant.

2.1 The Nature of the Patent Office

It will be remembered that the Constitution authorized Congress to promote the progress of useful arts by securing to inventors for limited periods of time the exclusive rights to their discoveries. It has previously been pointed out, however, that, apart from a few questionably-handled procedures, as under the compensation provisions of the Atomic Energy Act or the Space Act, pure scientists have not been rewarded by Congress. Instead, the latter has seen fit to enact patent laws applicable to the applied scientist and engineer, who takes

the discoveries of the pure scientist and makes useful arts out of them. In 1952, Congress codified the patent laws, adding, however certain modifications that purported to eliminate or at least curb the disposition of some courts to strike down patents as a matter of social philosophy.

The statute itself defines the structure of the Patent Office and the mode of its operation, charging the commissioner of patents with the responsibility for the examination of every patent application and for the issuance of every patent (and trademark). Thus the Patent Office must maintain a vast up-to-date technical library, otherwise the patent examiners assisting the commissioner will not have the facilities for making reasonably thorough investigations.

The commissioner is further assisted by an appellate board in the Patent Office, termed the Board of Appeals. The members of the Board, like the commissioner, are appointed by the president and are given the title of examiners-in-chief. Their function is primarily to pass on final rejections by the examining corps which deny the patentability of the claimed inventions. Fortunately, they are selected from the experienced ranks of the Patent Office personnel and are not, as yet, purely political appointees.

Before our inventor's newly filed patent application is examined for novelty, it is screened by classification examiners to determine whether the subject matter properly relates to the class of inventions handled by a particular group of skilled examiners. Since, however, applications are normally examined in the order received, and since there is, on the average, a year's backlog of cases, our inventor will probably have to wait that long before his application is reached.

When the examiner assigned to the case reaches the application, he (or she) studies it with particular attention to the claims of novelty which he is requested to allow. These claims, if allowed, represent the metes and bounds or scope of the patent grant. The examiner then goes to the division files of patents and publications, which are broken down into many thousands of classes and subclasses, and starts his search. He is looking for the prior art that is closest to the concept claimed to be new. He looks not only for the exact device described in the application, but also for others similar to it. If the patent attorney in the case has made his own search before filing the application and failed to find an exact anticipation, it is likely that the examiner will not find one either. However, even if the invention is not found in any prior patent or publication, but is the kind of thing that any mechanic skilled in the art could easily evolve from what is in a prior patent or publication, the device is not patentable.

Having completed his search, the examiner usually takes the course of rejecting the application on the basis of the closest prior art that he was able to find. There is a very definite reason for this. Being a conscientious public servant, the examiner is not disposed to hand out patents unless he is convinced that a really new invention has been made¹. By rejecting the case, he puts the burden of proof on the applicant to explain why the latter should be granted a

¹If our judiciary could only experience, as practicing lawyers, the difficulty involved in successfully prosecuting a patent application in the Patent Office, their respect for patents would undoubtedly increase

patent although others may have come as close to his purported invention as in the prior art cited by the examiner.

The attorney for the applicant must then reply within six months of the examiner's rejection, pointing out why the prior art is not pertinent to his client's claim of novelty, and, if the original claims did not clearly define that novelty, appropriately amending those claims. This process of rejection (or partial rejection) and amendment or argument continues until the examiner feels that an issue has been reached. In some cases, the examiner will allow the amended claims or, upon reconsideration, the original claims, or some of them, and the patent will thereupon be granted and will take its place among over three million United States patents. In other cases, the examiner will not be persuaded as to the matter of invention. The applicant's attorney insists; the examiner is adamant that there is no invention and makes his rejection final.

Sometimes the attorney will interview the examiner in person. He may then ask the primary examiner to review the assistant's decisions. At a conference, the assistant examiner gives the primary examiner his reasons for rejection, and the attorney presents his side of the case, perhaps with the help from the inventor himself. The primary examiner then makes his decision. If he agrees with the attorney, he overrules his assistant and allows the application so that they patent may issue. If, on the other hand, he feels that the assistant is right, he will not overrule him, but will suggest that the attorney turn to the Board of Appeals.

The attorney, in the latter event, files a brief before the Board in which he describes the history of the case, the nature and details of the invention, the meaning of the rejected claims, the prior art cited by the examiner upon which the adverse ruling was based, and the reasons, factual and legal, why the attorney considers the examiner to be in error. The examiner then files a reply brief presenting his views, and the case may be decided by the Board of Appeals on these two briefs alone. An oral argument may, however, be requested. The attorney will appear before the Board to argue his case, but the examiner from whom the appeal is taken usually does not appear at the hearing.

The Board may then sustain the examiner's rejection, or overrule it and order the patent to be granted. Sometimes the Board finds that, while it cannot sustain the examiner's position, the claims are not patentable for reasons other than those advanced by the examiner. In such an event, it will offer its own grounds for rejection, permitting the applicant to modify his claims in order to overcome the new objections or to ask for reconsideration of the new grounds.

Whenever two or more applicants are claiming the same invention, "interference" examiners are assigned the task of trying to determine who is actually the first inventor. Testimony is usually taken before a notary public or court officer, subject to cross-examination, and other evidence of invention activities submitted by the conflicting applicants. Aided by these, as well as by briefs and oral argument, a Board of Patent Interferences makes a decision as to who is the prior inventor.

The commissioner cannot by himself, of course, decide or give attention to the administration of all these matters. He therefore has several assistant com-

missioners of patents. And, parenthetically, lest it be considered that Russians are the only ones who utilize the talents of women in technical fields, we have recently been ably served by a lady assistant commissioner of patents on matters regarding trademarks.

2.2 Patent Office Problems

When there is a rapid turnover in the examining corps because of attractive offers from outside organizations, particularly to the younger examiners, the backlog of cases obviously mounts. The effectiveness and utility of the whole patent system are thereby damaged. Perhaps the greater administrative problems facing the Patent Office, therefore, are, first convincing the public and Congress of the importance of its functions; and, second, the urgent necessity for promptly dignifying the position of examiner so that it will attract competent career men and women.

Automation in the form of electronic computers may come to help in the searching process. Indeed, an interesting experiment for facilitating the examiner's search in certain limited chemical cases by computer techniques is under way.

Whether sufficient time and money will ever be provided to effect the copious cross-referencing in the electrical and electronic fields, as well as in the mechanical fields, necessary for the employment of computers in the task of searching, is a real question. An inventor who files an application for a new vacuum tube, for example, might find anticipation of his tube tucked away in a prior patent for a radio-receiver circuit, in which prior patent the very same tube might have been shown incidentally, but not claimed as part of the invention. The disclosure of the earlier tube would, however, be a bar to patenting the new one. Unless the information was entered into the computer that this tube construction was disclosed, though not claimed, in the radio-receiver patent, it will not be furnished by the computer. Today, however, an examiner, in scanning a patent, can notice such incidental disclosures not predicted by the title or normal classifications of the patent.

There is, accordingly, the stupendous problem of cross-referencing the minutiae and classifying every tiny component of all the combinations shown and described in patents, if computer searching is to be successful. This is something that, to some of us, looks quite impractical as yet. Classifying certain kinds of chemical compounds may be something else again.

In 1935, only 31,900 applications still awaited preliminary or further action by the examiners, i.e., were "pending." Recently, there were almost a quarter of a million of them ². And there are pending before the Board of Appeals about 6,000 cases, and some hearings have been set for more than a year after the appeal was entered.

The problem of speeding up the granting of patents, consistent with reasonably thorough examination and consideration, and particularly in the light of

²Senate Report No. 1430, Report of the Committee on the Judiciary, 86th Congress, 2d Session (1958)

limited budget and personnel, is thus still with us, though great strides have been made in keeping the Patent Office more nearly up-to-date.

2.3 Review of Patent Office Decisions

Suppose the Board of Appeals concurs with the examiner that an application discloses no patentable invention, and thus decides adversely to the applicant. Congress has provided two alternative remedies in the nature of court review of such decision³.

One is to file a suit against the commissioner of patents in the Federal District Court for the District of Columbia⁴. The complainant may ask the judge to review the adverse decision of the Board of Appeals, to hear the case for patentability of the invention afresh (a so-called action *de novo*), and to consider new and more detailed evidence as to the invention underlying the application and the reasons why the patent should be awarded. The District Court judge will either sustain the Patent Office rejection of the application or, if he disagrees with the Board of Appeals, direct that a patent be issued. At this trial, the commissioner is represented by his own solicitor, who cross-examines the applicant's witnesses and may present witnesses on behalf of the commissioner.

From an adverse decision of the District Court, one may appeal to the Court of Appeals for the District of Columbia Circuit. A final review by way of an appeal petition termed "certiorari" may be asked of the United States Supreme Court if the Court of Appeals refuses to reverse the Patent Office; but the Supreme Court is not apt presently to grant patents.

If, on the other hand, the applicant does not wish to go into Federal District Court, and is well satisfied with the evidence existing in the record of the prosecution of the application in the Patent Office, he can alternatively appeal to the Court of Customs and Patent Appeals, strictly upon that record⁵. This court was originally a so-called legislative court, set up under the provisions of Article I of the Constitution to serve as a tribunal of Congress, as distinguished from the judicial courts of Article III, such as the Federal District Courts, Courts of Appeals, and the Supreme Court. Congress has recently, however, converted the Court of Customs and Patent Appeals into a judicial court established under Article III. Five judges of the Court of Customs and Patent Appeals hear appeals both from customs decisions and from patent decisions. In the past, these judges have not been technically trained people, though recently patent lawyers have been considered for the bench and appointed to it, and the Court is looking more and more to them with regard to appeals from the Patent Office.

If the applicant is dissatisfied with the decision of the Court of Customs and Patent Appeals, he has the opportunity of petitioning for certiorari to the United States Supreme Court; but, within recent years, such petitions have not been granted. Similarly, when dissatisfied with the decision of the Board of

³The same remedies apply to trademarks and design patent cases also

⁴35 U.S.C. 145

⁵35 U.S.C. 141

Patent Interferences, the losing party may appeal to the Court of Customs and Patent Appeals, or may bring a suit in an appropriate District Court to have the Patent Office decision reversed, offering fresh testimony and evidence.

2.4 The Present Mood of the Courts

The courts of the District of Columbia are called upon, at times, to review not only the decisions of the Patent Office, but also the actions of nearly every federal administrative officer or tribunal. The Federal Communications Commission will award a radio station to party A rather than to party B; or the Secretary of the Interior will issue a land grant or a mineral lease to one party rather than to another; or the Secretary of State will deny the issuance of a passport; or some employee of the Army considers that he has lost his position unjustly. Persons dissatisfied with many administrative decisions come to the various courts of the District of Columbia each year. It is, of course, asking too much of a judge that he be skilled in the technical intricacies of all the matters handled by the various administrative agencies which, indeed, are presumably staffed by experts trained in the pertinent technical subject matters. Accordingly, the judge does not undertake in such cases to substitute his own fact finding for that of the administrative agency, except under rare circumstances. The courts have held very wisely that unless there is abuse by the administrative agency, unless the parties had not been given a fair hearing, unless there is no substantial evidence to support the agency's decision, or unless that decision is unconscionable and clearly erroneous, a court will not upset the administrative agency's findings even though, considering all the evidence, it might itself have decided the fact issues differently. A court will of course, maintain its important function of interpreting the law issues, and will readily substitute its interpretation of the law for that of the agency.

Suits against the commissioner of patents in the District Court for the District of Columbia are upon a little different footing, since the statute permits the District Court to receive new evidence not before the Patent Office nor considered by it and to make a decision based upon all the facts presented. During the relatively recent past, however, the Patent Office has been sustained in case after case by the District Court, apparently no matter what new evidence was offered ⁶.

Subsequent to the recent Patent Act of 1952, which was intended to exercise a stabilizing effect upon court treatment of patents, there have been a number of reversals of the Patent Office. Some judges of the Court of Appeals of the District of Columbia, however, are apparently still hostile, as indicated by dissenting Judge Danaher ⁷:

The philosophy permeating the majority opinion basically is one

⁶Attention is invited to the anomaly (unless one recognizes the hostility to patents) of the court's giving such great weight to the Patent Office findings of *no* invention when it has declined to grant a patent, and such little weight to its findings of invention and the resulting statutory presumption of validity in suits for infringement of patents granted by it

⁷*Watson v. Bersworth*, 727 O.G. 445, 251 F. 2d 898.

of nullification of the remedy provided by Congress, a result here reached (1) by according to the Patent Office the equivalent of a *conclusive presumption of correctness*; and (2) by holding that sufficiently of disclosure raises a question of law. *Relegated to zero status* is the District Court, with its finding, its conclusions, its memorandum opinion and its judgment. Judge Wilkin heard many witnesses, had the benefit of charts and exhibits, received detailed explanations as to the points in issue and possessed the advantage of colloquy with the opposing counsel. The record discloses close and careful attention to the many aspects of the case brought under 35 U.S.C. 145 which permits a dissatisfied applicant to pursue his remedy in the District Court with may adjudge the applicant entitled to receive a patent “as the facts of the case may appear.”

We recently pointed out that under governing case law and the Federal Rules, even as to patent cases, “a finding of fact by the District Court, sitting without jury, may be set aside on appeal only if it is clearly erroneous.” We noted that in such situations we are bound to inquire whether the District Court’s findings are clearly erroneous. Here, no effort is made by the majority to demonstrate that Judge Wilkin’s findings are “clearly wrong” or “clearly erroneous.” They are simply are peremptorily spurned as meaningless and nugatory in the context of the majority’s treatment of the problem. I shall later undertake to show that the District Judge, *with thorough conviction*, arrived at his amply supported findings on the new evidence before him. I fail to see how we could have otherwise than he did.

And, more recently, Judge Burger of the Court of Appeals for the District of Columbia stated that, while he was “compelled” to follow the “present state of the decisions” in sustaining the Patent Office holding of no invention, he felt that those decisions

impose barriers to patents far more stringent than contemplated either in the first instance by the Constitution or later by Congress⁸.

Judge Burger continued,

This case illustrates, to me, the *inhospitable attitude toward patents*, stemming in part from our natural aversion to monopolies. From the premise that monopolies are bad, it is argued that patents being monopolies are at least suspect. But a patent is a monopoly primarily in a technical dictionary sense, much as is ownership of land, and *we ought not let our reason be clouded by semantics*.

This lack of hospitality toward patents is suggested in the argument, sometimes made here by counsel for the Patent Office, that Buck

⁸*Boehringer Sohn v. Watson*, 256 F. 2d 712, 714.

Rogers comic strips which depict rockets, jets, and the space age will no doubt operate and be cited as “anticipation” of some patent applications for such devices as the fertile brain of the cartoonist depicts for the children. It appears that unrestrained imagination, unburdened by any responsibility for the hard, patient and painstaking work of development, can bar future patent protection for the men and women who actually implement and carry out the prediction and prophecies of the Buck Rogers comic strips and the “Fantastic Stories” of the paperback trade. Indeed, Patent Office counsel advise us that Rube Goldberg cartoons have been used for this same purpose. This hardly seems the way to encourage maximum incentive for those engaged in research and invention. This could mean that widespread research and experimentation in these areas might well, by economic necessity or default, ultimately become a Government monopoly.

We can hope, accordingly, that the remedy in the federal courts, intended by Congress to grant relief from improper Patent Office decision, will ultimately be interpreted to have been restored by the Patent Act of 1952 to patent applicants.

2.5 The Reports of Patent Office and Court Decisions

Scientists have their journals describing the latest advances in the various technological fields. Similarly, lawyers have the reports of the various administrative law tribunals, such as the Patent Office, and of the courts, containing decisions in litigated cases that illustrate the current legal interpretations placed upon the various statutes and regulations, as well as how various types of factual situations are currently treated by such tribunals and courts. From these decisions, as thus reported, a lawyer, through the process of analogy, tries to answer a client’s questions as to whether or not his invention is patentable, and what his legal rights may be in various situations.

In its weekly *Official Gazette*, the Patent Office publishes, in addition to regulations, rules, notices, and reports of interesting Patent Office or court decisions, a brief notice of every patent that has been granted during the week. That notice includes a typical drawing from the patent application, where appropriate, and a typical claim, perhaps representative of the scope of the patent grant⁹. Since the “claims” set forth the metes and bounds, or limits, of the exclusive privilege for which the patent was granted, an attorney, by scanning the *Official Gazette*, may learn of recent patent grants in the fields with which his clients are concerned, for the purpose both of keeping up to date and of learning of possible conflict with the client’s competitors.

Patents are classified in the *Official Gazette* as general and mechanical patents, chemical patents, and electrical patents. Design patents, also granted

⁹The *United States Patent Quarterly* (U.S.P.Q.) also contains Patent Office and court decisions bearing upon patents, trademarks, copyrights, unfair competition, antitrust matters, and the like; and, as later discussed, federal court decisions on all subjects, including patents, are also contained in other reports

by the Patent Office for new and ornamental esthetic designs of various kinds of items, are also reported.

In addition, the *Official Gazette* publishes trademarks that the Patent Office proposes to register, to enable anyone who considers that such registration may hurt him to file an opposition to it. A trademark is a mark (such as a symbol or word or the like) that a party in business adopts and uses in connection with his products or services. It serves to associate these products or services, in the public mind, with the business entity that is the source or their origin – “Ivory,” for example, as used on soap by Procter and Gamble. Unlike a patent, a common-law trademark is not obtained by registering it in the Patent Office, but merely by adopting and using it. However, federal registration of a mark, used in interstate commerce, provides, among other benefits, certain procedural advantages in enforcing the mark against infringers, and in obtaining trademark registrations in certain foreign countries.

I have dwelt briefly on this matter because there is today, in some quarters, renewed interest in the proposal that the Patent Office similarly publish in its *Gazette*, for opposition, its intention to grant patents. The theory is that if the public can oppose the granting of a patent by calling to the attention of the examiner some reasons why it should not be issued – such as a prior art that the examiner may have overlooked – the courts should give more than lip service to the present statutory presumption of the validity of a patent grant, discussed later, because the public had its chance to disprove the allegation of invention before the patent was issued.

In Chapter 6, I shall analyze a series of proposals for remedial legislation, including the matter of oppositions, which, for reasons later presented, I now believe more likely to be detrimental than helpful to the American patent system.

2.6 A Further Role of the Courts – Infringement Suits

Let us assume that a patent has been granted by the Patent Office. This office then loses jurisdiction of the patent, with a few minor exceptions. The next tribunal before which a patent may come is the federal District Court. How does this come about?

Somebody starts to “infringe” the patent. This may mean that someone other than the owner or a licensee under the patent makes, uses, or sells (or induces the making, using, or selling of) the invention in violation of the patent holder’s right to exclude others from manufacturing, using, or selling it. (A “licensee” is one who has obtained, by suitable contract with the patent holder or one authorized to act for him, a license or right to manufacture, use, or sell the invention with the assurance that he shall be immune from suit by the patent holder. Usually some kind of license fee, often termed a royalty and frequently based upon a percentage of the business involving the invention that the licensee may do, is involved in the license contract.)

When the patent holder learns about the action, he demands that the person involved cease and desist from his infringement and account for past infringe-

ment or, if the patent holder is prepared to grant him a license, negotiate such a license.

Suppose the infringer declines to stop infringing or to negotiate a license. The patent then serves, in the words of the late Professor George Washington Pierce of Harvard University, as “a license to bring a law suit.” The patent holder has the legal right to file a complaint in the federal District Court where the infringer resides or where the infringer is both doing business and committing his acts of infringement, requesting the court to issue an injunction prohibiting further infringement and to award damages to the patent holder for this unlicensed use of his invention.

The defendant-infringer must file an answer to the complaint, setting forth his reasons for defying the plaintiff’s patent rights. Usually, he will list earlier similar patents or publications and refer to earlier alleged inventors or users of the invention covered by the patent, in the hope that, at the trial, he will be able to convince the court that no real advance had been made over what had been done before, of sufficient scope to warrant a patent grant, and so the Patent Office erred in issuing the patent. The defendant also usually offers reasons why his product, in view of certain differences in construction, should not be considered an infringement of the precise invention described and claimed in the patent. Other defenses may also be offered.

I ought to mention, however, another important defense that is sometimes appropriate, namely, that the patent holder is misusing his patent in violation of our antitrust laws (including restraining or conspiring to restrain trade)¹⁰. He may have required certain illegal restrictions, such as forcing the licensee to purchase unpatented items for him, a restriction outside the scope of the actual legal right, privilege, or “monopoly” (using the latter term in a loose sense) afforded by the patent grant.

The defendant also customarily attacks the patent by way of a counterclaim, upon the same grounds used in defending a suit for infringement. He asks the court to issue a declaratory judgment that the patent is invalid or otherwise unenforceable, or that the defendant’s products are not infringements. In this way, should the plaintiff withdraw his suit, the defendant’s counterclaim will still be before the court for adjudication.

The complain, the answer, and the counterclaim are the customary documents filed in the ordinary run-of-the-mill patent suit.

By the time the case comes to trial, the judge has usually required the defendant to narrow down the list of allegedly prior art patents, publications, and uses that he is going to rely upon as anticipatory of the invention. At the same time, the judge has required the plaintiff to state the dates of invention which he is trying to prove, and the particular claims on which he rests his case.

The judge then hears the case. The plaintiff, usually with the aid of a technical expert, such as an engineer or scientist familiar with the field of the invention, explains to the court what the patent covers, translating engineering and technical terms and concepts into layman’s language. He explains the

¹⁰Such as the Clayton and Sherman Acts.

problem that this invention is supposed to solve, and then offers evidence as to what the defendant is doing and why this constitutes infringement of the patent claims. The plaintiff then rests his case. Why? Because our law says that a patent is presumed to be valid; that is, the process of examination in the Patent Office has given the patent an aura of being valid under the law. This means that the defendant has the burden of proving that the patent is not valid. And here the law, at least in theory, imposes upon the defendant a very heavy burden. The plaintiff has presented what is termed a prima-facie case, and it is incumbent upon the defendant to proceed with his proofs. However, in the event that the defendant overcomes, by his evidence, the plaintiff's prima facie case, the ultimate burden of proof of validity rests with the plaintiff.

The defendant may call his technical expert to the stand to explain the disclosures of the prior patents or publications (and also prior uses) before referred to, trying to convince the judge that the invention was either previously disclosed or publicly used, or that, contrary to the patent examiner's view, any individual skilled in the art (as distinguished from an expert) would know how to make this invention. The plaintiff may, of course, cross-examine the defendant's witnesses. When the defendant has completed his defense, the plaintiff has an opportunity to rebut.

The judge must then make a decision. He studies the subsequently filed briefs of the parties and the transcript of the testimony, makes up his mind, and writes a decision. The federal rules of civil procedure require that he make specific findings of fact and conclusions of law, with regard to the validity and infringement of the patent. He must present his findings in writing.

These patent decisions and other decisions in all fields of the federal District Courts are reported in a series of volumes known as the *Federal Supplement*, which is abbreviated as "F. Supp.," with the volume number as a prefix and the page number as a suffix.

The trial judge's decision, however, is not final. He is but the first rung of an echelon. The losing party has a right to appeal from his decision to a Circuit Court of Appeals. A circuit is a geographic area generally comprising a few states. The First Circuit, for example, is composed of Massachusetts, Maine, New Hampshire, Rhode Island, and the possession of Puerto Rico. The Court of Appeals for the First Circuit sits in Boston, and hears appeals from all of the federal District Courts in its circuit. In all, there are ten circuits plus the District of Columbia.

The Courts of Appeals customarily sit in panels of three judges, and review the District Courts' decisions, sustaining the trial judges or reversing them, as the case may be. The decisions of the Courts of Appeals are reported in the *Federal Reporter*, abbreviated "F.," for a first series of volumes, and "F. 2d" for the present second series.

Sitting above these Courts of Appeals is the United States Supreme Court. A party losing a patent appeal in a Court of Appeals does not have an absolute right to heard by the United States Supreme Court. Under Article III of the Constitution, the Supreme Court must, in theory, take certain kinds of cases, but these do not include patent appeals. The losing party must, according,

petition the Supreme Court by way of the before-mentioned petition for a writ of certiorari, asking the Court, in its discretion, to review the decision of the Court of Appeals.

The Supreme Court grants very, very few such writs. It is more likely to grant certiorari in a vitally important case involving large companies than in the case of smaller companies, or individual litigants, even though the issues may be the same.

Recent past experience has been that when a Court of Appeals sustained a patent, there was likelihood that the Supreme Court would grant certiorari, and then proceed to destroy the patent. Where a Court of Appeals has thrown out the patent, however, there is no case in modern times of which I am aware where the Supreme Court granted certiorari to reinstate it.

The decisions of the Supreme Court are reported in several different volumes, one of which is the United States Reports, abbreviated as "U.S." I shall, for instance, later refer to the Bell Telephone Cases, which are reported at 126 U.S.

Anyone desiring to find the decisions of trial and appellate courts, accordingly, may consult the *Federal Supplement*, *Federal Reporter*, and *United States* decisions (or, in the case of patents and related fields, the *United States Patent Quarterly*), and he will find there exactly what reasons were advanced by the various courts for sustaining or destroying patents.

With the aid of these reported past decisions, a lawyer can try to instruct his client as to the expression and application of the law by the courts, and so map out a procedure to meet his client's situation.

CHAPTER 3

THE PATENT LAW

While the classes of patentable inventions and statutory restrictions are readily set forth, with illustrative cases, the question of what is “obvious” and what is “invention” under the 1952 Patent Act is unsettled . This chapter accordingly concludes with a discussion of this vital question which the Supreme Court has thus far refused to hear. Here are presented the author’s views based, in part, upon the current very real role played in American innovation by the independent inventor.

There must, clearly, be a set of rules or norms by means of which to establish the various kinds of invention (using that word in its popular sense for the moment) that may be patentable or, at least, the circumstances under which public policy requires that a patent may not be granted.

As noted earlier, Congress set forth, in the Patent Act of 1952, a codification of our patent laws, restating the substance of prior statutes and adopting constructive court-made law established prior to the 1930’s. But, in addition, it introduced changes in the law primarily directed at curbing the damage to the patent system effected by recent destructive policies of the Supreme Court. Included in these curbs are the abolition of the doctrine of “flash of genius”¹ as the test for invention, later discussed, and the loose and ready invalidation of patent claims as defining the invention functionally, instead of structurally.

3.1 Classes of Patentable Invention

The 1952 Act was passed pursuant to the previously discussed Constitutional provision in Article I, Section 8, empowering Congress to promote the progress of useful arts by securing for limited times to inventors the exclusive right to their discoveries. Two words are used here: “inventors” and “discoveries.” While invention and discovery may involve different concepts to the linguist, in patent law, they had previously meant the same thing and been used synonymously. The first provision of the 1952 Act, Section 100, thus sets forth that “the term

¹*Cuno Engineering Corp. v. Automatic Devices Corp.*, 214 U.S. 84, 91 (1941)

'invention' means invention or discovery." As explained before, the word "discovery" does not include the bald discovery of a scientific principle, and the definition in Section 100 appears to limit the word to mean only "invention," as that term had been used in prior court decisions.

The statute then proceeds to define various classes of invention – listing a process, a machine, a manufacture, a composition of matter, or a material. Some of these words are a little bit out-of-date today, but they came from the very early patent acts when the only appropriate term to describe an invention was a "machine" or a "manufacture." In our modern vernacular, a "machine" is hardly descriptive of an electronic component or circuit; but the courts, following the lead of prior Supreme Courts and the actual desires and intentions of Congress, continue to use this older language of the statutes. Thus, a piece of apparatus that achieves a useful result functionally is a "machine," and an item that can be produced or manufactured by a machine is an article "manufacture." As an illustration, apparatus for weaving cloth is a "machine;" the cloth, when woven, is a "manufacture."

The term "composition of matter" is self-explanatory. If someone invents a new chemical compound, that compound may be patentable. If someone else merely discovers a chemical compound or element existing in nature, that is not patentable. Thus a claim to an electric lamp filament wire formed of ductile tungsten was invalidated ². The General Electric Company inventor, W. D. Coolidge, had made an important advance in a ductile-tungsten filament for lamps. He had accomplished this by removing impurities from tungsten as found in nature; but removing impurities from natural tungsten to make it ductile resulted only in pure tungsten, which is inherently ductile. Pure tungsten, of course, is a natural element, even if it never found pure in nature. It is interesting to note that the judge who invalidated this patent (Judge Morris of the District Court for the District of Delaware) had himself previously sustained the patent. He had not then, however, been presented with the argument that the patent covered merely an element of nature in its pure state; but when so informed, reasoned that it could not be the subject of a "monopoly," even though never found pure in nature. An element is not included in the statutory classes of invention.

"Material" is a new word in the statute and may have a meaning very similar to that of "manufacture," though a "material" may be produced by a process that would not, in conventional language, necessarily be termed "manufacturing."

"Process" is defined, in part, as a "process, art, or method." It usually embraces a series of steps for accomplishing or producing a certain result. A chemical process is, of course, quite easy to comprehend. The next chapter, which discusses the *Bell Telephone Cases*, will show that there may also be an electrical process.

Suppose someone arranges the various parts of an old machine in a novel manner to perform a new operation. Is this a process or method? A case of this

² *General Electric Co. v DeForest Radio Co.*, 28 F 2d 641.

sort came before the United States Supreme Court in connection with adjusting an existing metal-perforating machine so that, instead of merely perforating the metal, the dies lifted the perforations out and twisted them to enlarge the perforations, thereby making an expanded metal sheet³. The defendant argued that this was not within the patentable classes of invention since the original “machine” with its dies was old and thus was not patentable, and, additionally, the ultimate “manufacture” – the expanded metal – was an old article. By this reasoning the inventor had not produced a new machine, a new manufacture, or, obviously, a new composition of matter. Nonetheless, the Supreme Court held that this invention involved a new process, although, on several occasions, that Court had previously intimated, by dicta, that there could not be a novel patentable process or method unless it involved chemical, electrical, or other “elemental” phenomena. This case, however, decided that a patentable process, art, or method could also involve mechanical manipulative steps: it could be a new way of operating an old machine to obtain new results.

In addition to the definition of the term “process” as meaning “process, art, or method,” the Patent Act of 1952 also provides that “process” shall include

A new use of a known process, machine, manufacture, composition of matter, or material.

To appreciate the significance of this definition, let us recall the case of Dr. William Morton, a Boston dentist, who is credited, in some quarters, with having been the first to make the discovery, and the use of ether was immediately adopted. The New York Eye and Ear Infirmary and a number of other hospitals, indeed, freely infringed upon Dr. Morton’s patent. Suit was entered which freely infringed upon Dr. Morton’s patent. Suit was entered for infringement⁴, and the court found that Dr. Morton “was entitled to be classified among the greatest benefactors of mankind.” But, the court questioned, was the claimed invention a new process? No, there was no new series of steps involved. Researchers had previously inhaled ether. (Question: Had they previously inhaled it to the extent taught by Morton to produce the new effect of anesthesia?) Dr. Morton was claiming the use of ether for the purpose of anesthetization. That is not, said the court, a new “art” or “process.” Was it a new composition of matter? Ether had been discovered before. Was it a new machine? No. Was it a new manufacture? No. The court concluded, therefore, that this epoch-making discovery was not one included in the limited classes that Congress defined as among those patentable. So Dr. Morton’s patent was thrown out.

A discovery may be brilliant and useful, and not patentable. . . . Something more is necessary. The new force or principle brought to light must be embodied and set to work, and can be patented only in connection or combination with the means by which, or the medium through which it operates.

³*Expanded Metal Co. v. Bradford*. 214 U.S. 366 (1909).

⁴*Morton v. New York Eye Infirmary*, 17 Fed. Cas. 879, 5 Blatchf. 116 (1862)

To cite another illustration: the citrus fruit industry had long been troubled with a blue mold that formed upon citrus fruit shipped from the South. It was discovered that if oranges were coated with a solution of borax, specks or cuts in the fruit became thoroughly covered over and no formation of the mold would take place. A patent was applied for and obtained by the Brogdex Co. covering the product and the process for making it. It was claimed that fresh citrus fruit of which the rind of skin carried borax in a very small amount is rendered resistant to blue mold. The American Fruit Growers infringed this patent and Brogdex brought suit. The district court and the court of appeals held the patent valid and infringed. The Supreme Court, however, held that this invention was neither a machine nor a composition of matter⁵. It was also not an article of manufacture, because there was no change in form or appearance of the fruit (much as Coolidge still only produced tungsten). In other words, it did not belong to any of the patentable classes and could not, therefore, be protected by patent. As for claiming the discovery in method form, the Supreme Court held that the use of borax had been known before, not for filling up small specks to prevent blue mold, but for preserving fruit, and the method of applying the borax was the same as used here (much as Dr. Morton's method of applying ether to the nostrils was allegedly old). One could not obtain a patent for a new use of an old method.

Let us assume, by way of contrast, that in the process of treating the orange with borax some chemical reaction took place so that the orange was no longer an orange, and the borax was no longer borax. We would then have a new composition of matter – neither orange nor borax. Would this be patentable? A similar case occurred where it had been found that, in dyeing fur to preserve it, a chemical reaction took place which actually made a new preserved fiber out of the natural hair. It no longer had the characteristics of the natural fur. It no longer had the characteristics of the natural fur. Under these circumstances, said the circuit court of appeals⁶, the invention was a new article of manufacture and hence within the patentable classes of invention.

One can see, accordingly, that there is room for great latitude and ingenuity of argument in trying to construe a discovery as being within one of the patentable classes. A hostile court will not permit the law to grow with scientific discovery, whereas a court with a zeal to protect property rights in discoveries (under Article I, Section 8 of the Constitution) can offer great encouragement to the promotion of progress in the useful arts.

We can all probably understand why Congress has not seen fit to permit patents to be granted for mere scientific discoveries. Something is wrong, however, if a practical application of such a discovery cannot be construed as being within the patentable classes of invention set forth by the Congress for that very purpose. Dr. Morton, for example, did not try to patent ether all over again; he tried to patent its use for a particular new result. Should not that take it out of the category of pure scientific discovery? Congress, the engineering, sci-

⁵*American Fruit Growers, Inc. v. Brogdex Co.*, 283 U.S. 1.

⁶*Steinfur Patents Corp. v. William Beyer, Inc.*, 62 F 2d 238.

entific, and business people, and the lawyers who were responsible for the 1952 Patent Act appear to have answered this question in the affirmative by defining “process” to include “a new use of a known process, machine, manufacture, composition of matter, or material.” While the paucity of court decisions makes it too early to form an opinion as to the ultimate effect of this new definition, the Board of Appeals of the Patent Office has already construed it to mean that the new use must be one not analogous to, but radically different from, the kind before involved, and that the patent claim must be couched in the form of a process or method and not of an apparatus.

3.2 Conditions of Patentability

Turning, now, to the definition in the statute of *patentable* invention, we find that Section 101 is limited to “Whoever invents or discovers.” This means an individual or individuals, since a corporate body or other organizational entity cannot itself invent or discover. The individuals who do this creating and this inventing may, however, assign their patent rights or a portion thereof, in writing, to a corporation or to the government, so that a patent or a part thereof may actually be owned by others than the inventor. But the application must be filed in the name of the first inventor or inventors. The language provides that, in this country, a patent can be issued only to the first inventor. In Great Britain, patents were and are granted to anyone who brings a new invention into the country. The British philosophy encourages the importation as well as invention of new techniques. Not so in this country, however, for if a patent should be granted to someone other than a first inventor, it will be thrown out by the court as invalid.

Continuing with Section 101, the inventor must invent or discover a “new and useful” invention. The matter of the requirement for novelty has previously been discussed. As for the word “useful,” nearly everything has been held to be useful. Among the exceptions are devices for promoting fraud or that are injurious to the public health or against public policy. A “perpetual-motion” machine or any other inoperative proposal lacks utility. There are then set forth the before-mentioned five classes of patentable invention: “process, machine, manufacture, or composition of matter” or “material”; and, in addition, “any new and useful improvement thereof.” Not everyone can make a basic invention, but the law entitles one to seek a patent for an improvement in a machine, manufacture, composition of matter, or process.

Section 101 also states that one may obtain a patent in the above classes, subject to the requirements given in Section 102, which sets out the “Conditions for patentability, novelty and loss of right to patent.” The Congress has positively declared that “A person *shall be entitled* to a patent unless. . .” This appears to have been an effort (not yet successful) to curb the indiscriminate invalidation of patents.

The first restriction is that a patent cannot be granted if the invention was known or used by others *in this country* or patented or described in a printed publication *in this or a foreign country*, before the invention thereof by the

applicant for a patent (Section 102 [a]). The inventor does not have to be actually aware of such prior knowledge, use, publication, or patenting, for, if the invention was “described in a printed publication” or a prior patent was issued *anywhere at all* before he made his invention there would be an absolute bar to granting him a patent. Even if the prior patentee did not claim the same inventive features, but merely “described” the invention adequately in a patent issued prior to the present inventor’s concept, this description becomes a statutory bar. This restriction demonstrates the importance of patent and literature searches of both United States and foreign patents and publications before filing a patent application.

As for the phrase “*known or used by others in this country*,” a little history is in order. This was not always the law. The early patent statutes set up as a bar to patentability knowledge or use anywhere in the world. Realizing the importance of encouraging the utilization of new concepts in this country, however, Congress revised this to cover only prior knowledge or use in this country – a sore point in our current relations with foreign countries. If the invention was known or used abroad but was not patented or described in a printed publication before the invention was made here, no bar exists to obtaining a patent in this country, provided that the inventor did not know of this knowledge or use abroad. Of course, if he did know, he did not make the invention.

The courts have interpreted the word “known,” moreover, in a very strict sense to mean that “an invention . . . has been completed by reduction to practice ⁷.” The invention is not “known” if it is a prior “conception only” (such as a laboratory notebook drawing or disclosure, or an unpublished manuscript), or if “prior machines” have not “been working machines” but “mere experiments.” Even the knowledge by individuals in this country, prior to an inventor’s invention here, that a certain device had been previously used abroad successfully, is not with the statutory term “known ⁸.”

The term “used” is similarly the subject matter of much court construction. Briefly, it means a public use ⁹ and not an experimental or secret use, and does not include mere conceptions or abandoned experiments, such as those made in company laboratories or in institutions of learning and not followed up by publication, reduction to practice, actual public use, or patenting.

All of this has to do with knowledge, use, patenting, or publishing (Section 102 [a]) *before* one makes an invention. There is also a time limitation. If an applicant waits too long, even though there is no prohibition under Section 102 (a), he may be out of luck in view of the restriction of Section 102 (b), which provides that a person shall be entitled to a patent.

unless the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of the application for

⁷ *Application of Schittler*, CCPA, 234 F 2d 882, 887.

⁸ *Doyle v. Spaulding*, C.C. 19 F. 744; *Westinghouse Machine Co. v. General Electric Co.*, 2 Cir., 207 F. 75, *City of Milwaukee v. Activated Sludge, Inc.*, 7 Cir., 69 F. 2d 577.

⁹ *Paddies, Inc. v. Broadway Dept. Stores*, 147 F. Supp 373.

patent in the United States.

Even though he may be qualified under Section 102 (a), therefore, if he does not file the patent application until more than a year after publishing a thesis or scientific paper on the invention, he is too late to obtain a patent. If, before filing, he waits more than a year after someone else has described his invention in a publication, again it is too late to obtain a patent. And the same is true if he files more than a year after his invention first went into public use or was put on sale.

In some foreign countries, it is too late to file for a patent after any document describing the invention has been made public in the country in question; this is the case, for example, in Great Britain. In Germany, a description of the invention in public print in any language or country, before the German application is filed, bars a German patent. It is not entirely safe, therefore, to delay filing until after publication to obtain foreign patent protection.

The last-named restrictions of Section 102 (b) in connection with “public use” or “sale” are very important to the applied scientist or engineer. His new products are always going out for tests, for sale, for use; and the question arises as to when he should file a patent application. Perhaps one of those fundamental cases that partially answered this question arose in Boston in the late nineteenth century in connection with the invention of wooden paving blocks. The patent was not applied for until several years after these blocks had been in use in a toll road. The defendant infringed that patent, contending that it was invalid since the blocks had been in public use on the street more than two years before the inventor had filed his patent application. (At that time, the statute provided for two years of public use instead of one year, as at present.) The Supreme Court found ¹⁰ that there was no way of proving the efficacy of this invention except by actual test on a street, and the circumstances showed that the inventor was merely trying to test whether or not the invention was any good. The Court, accordingly, construed this, not as a “public use,” but rather as an experimental one.

Along came the case of a gentleman who invented steel stays for women’s corsets, in place of whalebone as before. He gave a sample to a lady friend to try out, and she used it for several years. Then the inventor filed for his patent. When the case reached the court, the defendant set up as a “public-use” argument the fact that this corset had been worn for more than two years before the inventor filed his patent application. The inventor, on the other hand, argued according to the rule of the paving-block case before mentioned. The court thereupon laid down a second important rule ¹¹, namely, that even a single use by a member of the public, except under such restrictions or conditions as would clearly delineate experimental or confidential use, constitutes a bar to the granting of a patent, unless the application is filed within the statutory period. And this very rigid rule had been discovered by several companies, with important patents, much to their sorrow.

¹⁰ *Elizabeth v. Pavement Co.*, 1877, 97 U.S. 126, 134-135.

¹¹ *Egbert v. Lippman*, 104 U.S. 333.

In a recent case ¹², suit was brought for infringement of a patent dealing with a process for casting patterned plastic sheets. The defendant showed that more than a year before the application for patent the plaintiff had sold several hundred plastic sheets made by the patented process. Thereupon, the plaintiff insisted that this use of the patent and sale of the product created by its process were merely experimental to determine the "production controls" necessary for the successful commercial exploitation of the patent; but the court held that this constitutes a "prior use" within the meaning of the statute.

This decision points out significantly the importance of filing a patent application not only for the new article, but also for the process involved in the manufacture of the article, within a year after the first sale. The safest procedure is to file before the public obtains the article, and even before it is put on sale. The term "sale," moreover, has been interpreted by the courts to include an offer for sale. Thus the matter of patent protection, both for the article and for the method of making it, should be very carefully explored well within the year after any offer to sell or any public use.

Returning to the restrictions in Section 102, we see that part (c) bars a patent if the inventor has abandoned his invention. Even if one has produced and tested an invention, so as to establish its so-called reduction to practice, but has put it away on a shelf and forgotten it, and in the meantime it is independently invented by another person, he cannot prevail as the first inventor against the second person. Abandonment does not promote the useful arts, and accordingly it is not in accordance with our public policy to reward such inactivity. It is very important, therefore, to realize that one cannot put ideas away and forget about them, and then hope to resurrect early dates for them at a later time. Those early dates not utilized are of no avail against the diligence of others.

Section 102 (d) relates to the effect of foreign patent filing. One must file a separate patent application in each country in which one wishes the invention protected, though it now appears likely that a single European Economic Community patent may be established within a very few years, as discussed in Chapter 7. Under the Universal Copyright Convention ¹³, a copyright registration in one country serves also as one in the other foreign countries which are members of the convention. Patents, on the other hand, must be obtained through the individual patent offices of the respective countries. Section 102 (d) provides that, if one has filed in a foreign country more than twelve months before filing in this country, and if the patent issues abroad before the filing of the United States application, he is barred from obtaining a patent here.

This goes hand in hand, however, with a provision of a different convention ¹⁴, by which one may file abroad in any foreign country that is a member of

¹²*U.S. Chemical Corporation v. Plastic Glass Corporation*, 3 Cir., 243 F. 2d 892 (1957).

¹³The United States is a signatory to this 1952 Convention, implemented into our law by Public Law 742, 83d Congress, effective September 16, 1955.

¹⁴Convention of Paris for the Protection of Industrial Property of March 20, 1883, as amended December 14, 1900 (Brussels); June 2, 1911 (Washington, D.C.); November 6, 1925 (The Hague); June 2, 1934 (London). A further conference at Lisbon, October 6 - 31, 1958 resulted in further amendments.

this other convention, and thereby obtain the effective benefit of the earlier filing date in the United States, provided the foreign filing is done within twelve months of the United States filing date. Similarly, foreigners may file here with reciprocal privileges. There is thus a year's leeway in which to decide whether or not to file abroad; and foreign applications claiming the convention benefits, if filed with that year, will be treated as if they had been filed simultaneously with the United States application.

The United States Government, however, does not permit its citizens to file abroad as an absolute right. This is because of national-defense statutes. The patent application filed in the Patent Office is examined by Army, Air Force, AEC, and other personnel, assisting the commissioner of patents, to see whether it contains information which might jeopardize the security of the country. If the answer is in the affirmative, the commissioner will issue a secrecy order, prohibiting any filing abroad before obtaining a license from the government to do so. If, under those circumstances, one still wishes to file abroad, he may petition the commissioner, offering reasons why secrecy should not be required in the particular case. The commissioner will take up the matter with the branch of the service which, in the first place, considered that the invention involved classified material and then a decision will be reached as to whether or not to permit filing abroad, and in what countries. If, however, after one has filed an application, he does not hear within six months from the Patent Office that the case has been put under secrecy orders, he automatically obtains a license to file abroad, except that special permission may be required for Iron Curtain countries.

Section 102 (e) provides that if an invention has been described in a patent granted to another on an application filed before one has himself independently made the same invention, there is a bar to his obtaining a patent in this country. If the prior patent *claims* the invention, and if the independent inventor made his invention before the filing date of the application for the prior patent, then he may ask the Patent Office to declare an interference contest between himself and the other patentee. In this way, he may have the right to take *inter partes* testimony for a determination as to who is really the first inventor. If the patent discloses, but does *not* claim the invention, however, and again, the independent inventor made the invention before the filing date of the application for the prior patent, the independent inventor may present *ex parte* evidence, by means of affidavit¹⁵, to demonstrate his earlier date of invention, and thus remove the other patent as a bar to the granting of his.

Section 102 (f) deals with the necessity, previously discussed, for the applicant to be the first inventor.

3.3 Interference

Section 102 (g) provides for interference contests mentioned above to determine priority of invention where more than one person is claiming to be the original inventor. The statute describes the court-established rule that the first applicant

¹⁵Patent Office Rule of Practice No. 131

to file is not necessarily, in law, the first inventor. The inventor is the first to reduce it to practice, but there is one exception to this rule. If, though the last to reduce it to practice, he was the first to conceive, and was diligently working at it when his rival entered the field and continued to do so until his reduction to practice, then he is the first inventor.

Perhaps a few definitions of interference terminology may be helpful. *Conception* involves obtaining the complete mental picture of the invention, even though one has not yet built it. If one is to rely upon a drawing or a notebook disclosure or the like to prove conception, he must show that all of the elements of the claimed invention in controversy are present or implied therein. The keeping of full notes is thus greatly to be desired. *Reduction to practice* of the invention means either building and successfully testing the invention (though there are some exceptions to this necessity in the case of very simple devices) or filing a patent application for a theoretically operative model. Building and successful testing is termed “actual” reduction to practice, filing a patent application may constitute a “constructive” reduction to practice. *Corroboration* by a qualified witness to the inventor’s tests is important, since the courts, in order to avoid possible fraud, require such independent corroboration of the inventor’s testimony before accepting the latter’s alleged dates.

Many times, however, particularly if an individual with neither money nor time with which to build and test an invention is satisfied with the theoretical operativeness of the invention, he may protect his rights by filing a patent application, and thus obtain a constructive reduction to practice. The United States Government currently takes the position, in contracts granted to develop or adapt inventions, that, no matter how much money one may have spent in developing a conception or in reducing it to practice by filing patent applications and the like, if government money in substantial amounts is appropriated to build the invention for the first time under the contract, the government must be granted a free license, with no strings attached¹⁶. The government may then, with impunity, give to others than the inventors and developers the business of building the invention commercially for it.

As a former member of a bar-association committee on government patent policies, I can state that, unfortunately, many lawyers are apathetic in this matter, which puts a particularly onerous burden on the small company. It is the government, however, that suffers in the long run when individual inventors and their companies are discouraged from suggesting the creative flashes from which have sprung the seeds, not only of our weapons of defense and offense, but also of our economic expansion and development.

3.4 The Statutory Test of Invention

The court-made law relating to the requirement for the exercise of a “flash of creative genius,” in order to support a patent, laid down by Mr. Justice Douglas

¹⁶The Armed Services Procurement Regulations provide an exception in cases where the Government funds are relatively small and in other similar circumstances.

¹⁷, was overturned by Congress in the last sentence of Section 103 of the Patent Act of 1952:

Patentability shall not be negated by the manner in which the invention was made.

It has been superseded by another and entirely different test which assumes that the requirements of Section 102 have been met. It reads:

A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the *subject matter as a whole would have been obvious* at the time the invention was made to a *person having ordinary skill in the art* to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The Supreme Court has, as yet, declined every opportunity offered it to interpret this statutory provision of the ultimate test of whether an improvement is or is not sufficiently significant to warrant a patent grant. Since this question is the most pressing to every inventor, engineer, or other party concerned with inventions, a discussion of the history of this legislation and at least certain lower-court views with regard to it may be helpful.

A “person having ordinary skill in the art to which said subject matter pertains” has been the standard set up ever since at least 1850 ¹⁸. Unfortunately, however, that standard has not always been met, but has varied with the different courts. When one court was desirous of sustaining a patent, one standard was set up. When another court desired to invalidate a patent, the standard was quite different. Matters reached such a state that, as before mentioned, the standard became no longer a “person having ordinary skill in the art to which said subject matter pertains” but rather one inspired by “the flash of creative genius.”

This “flash-of-creative-genius” standard has raised a storm of protest throughout the country, since in practice it is almost impossible to attain. Such a yardstick would have invalidated many of our most important patents, including Eli Whitney’s cotton gin, McCormick’s reaper, the sewing machine, the air brake, the telegraph, the telephone, and the electric lamp. Such invalidation, of course, would have discouraged invention.

Whether or not this result would have pleased a minority of justices of the Supreme Court, it certainly did not please Congress. And the reaction of Congress, moreover, did not arise out of any solicitude for our large corporations:

¹⁷ *Cuno Engineering Corp. v. Automatic Devices Corp.*, U.S. 84, 91 (1941).

¹⁸ *Hotchkiss v. Greenwood*, 11 How. 248, 267 (1850).

Rather, through the operation of the patent system the small company and the newcomer has been able to gain a foothold without being subject to appropriation of developments by the larger entrenched firms. Polaroid, Thiokol, Mallory, and many others, represent small and modest sized businesses which have launched new products against the competition of an existing industry . . . It should not be assumed that every time an excuse is found to invalidate a patent, competition necessarily benefits ¹⁹.

Even so, Congress had no desire to change the law, but rather to lower the “flash-of-creative-genius” standard to the level of the “person having ordinary skill in the art to which said subject matter pertains.” Congress itself said so, in the Reviser’s Note to Section 103:

This paragraph is added with the view that an explicit statement in the statute may have some stabilizing effect. . .

It is of interest to observe, therefore, that the late Judge Learned Hand held ²⁰ that Section 103 does not actually constitute new legislation, but rather restores the law to what it was “twenty or thirty years ago” before the courts began to adopt the standard of “the flash of creative genius.” Some courts have followed Judge Hand’s decisions; others have not.

Congress seemed convinced that only by such a restoring of the law would the confidence of inventors be re-established and the progress of the useful arts promoted. Therefore, it is again studying the problem with the object of enacting further legislation. A subcommittee of the Senate Committee on the Judiciary has been hearing testimony and collecting evidence for some years. Several reports by that subcommittee have expressed dissatisfaction with the large number of patents still being invalidated by the courts.

It may be well here to state that Section 103 had its origin in this very dissatisfaction. In the report of the National Patent Planning Commission, 1943, headed by the late Charles F. Kettering, for example, appears the following:

The most serious weakness in the present patent system is the lack of a uniform test or standard for determining whether the particular contribution of an inventor merits the award of the patent grant. There is an ever-widening gulf between the decisions of the Patent Office in granting patents and decisions of the courts who pass upon their validity. It would be highly desirable and a great step forward if patents could be issued with a greater assurance that their validity would be upheld by the courts. No other feature of our law is more destructive to the purpose of the patent system than this existing uncertainty as to the validity of a patent.

¹⁹George E. Front, “The Patent System and the Modern Economy,” Senate Subcommittee on Patents, Trademarks and Copyrights, of the Committee on the Judiciary, Study No. 2, page 77, 84th Congress, 2d Session (1956).

²⁰*Lyon v. Bauch & Lomb Optical Co.*, 2 Cir., 224 F. 2d 530 (1955), certiorari denied 350 U.S. 911, 955.

3.5 Obviousness of “Subject Matter as a Whole”

The restriction that an invention is not patentable if it is obvious as a whole, and not merely in part, has been in force at least back to Supreme Court decisions in the late 1800’s²¹.

The Century Dictionary gives the following definition of “obvious”: “easily discovered, seen, or understood; plain; manifest; evident; palpable.” The way to determine whether an invention is obvious, accordingly, is by evidence.

In patent-infringement suit after patent-infringement suit, the plaintiff has offered evidence to show that he was the first to have offered a sought-after solution to an existing problem and that, after disclosure of his solution, the defendant appropriated it. The courts, in sanctioning this appropriation, have rarely disagreed with the plaintiff in his showing, but have thrown out his patent as involving merely an “obvious” step or device. But such reasoning raises questions.

If the solution of the problem disclosed by the inventor was obvious, why did not the defendant adopt it earlier? Why did he wait until the invention was placed upon the market by the plaintiff? If the prior-art developments constitute satisfactory solutions of the given problem, as every defendant argues, why do not the defendant use that prior art, instead of spending money in litigation in order to obtain the right to use the plaintiff’s invention? If, on the other hand, the prior art is not satisfactory, can it really be contended that the plaintiff has accomplished no more in his device than, “as a whole,” was obvious in the prior art?

But in case after case the courts have insisted in holding the invention “obvious” in the light of hindsight in prior-art knowledge, in the face of indisputable showings that there was no “person having ordinary skill in the art to which said subject matter pertains” to whom the invention was as that time “obvious.” Recently, a court of appeals sustained a district court’s holding²² that “I am not so troubled” about “Monday-morning-quarterbacking” as more “sensitive judges” would have been; “it does not seem to *me* to require inventive genius” to make the plaintiff’s invention; “I am unable to perceive invention.”

In an earlier day, a district court judge similarly remarked²³. “I am satisfied that it amounts to nothing more than . . . I am unable to see how . . .”; and the court of appeals reversed the decision, holding that these statements were not findings of fact, but merely expressions of opinion, with “no testimony in the record to support it.”

The statute in Section 103, however, makes it plain that the question to be decided by the court is *not* what may seem obvious after the event to lay courts or even technical experts, but, rather what

²¹ *Bates v. Coe*, 98 U.S. 31, 48 (1878), *Imhauser v. Buerk*, 101 U.S. 647, 660 (1879), *Parks v. Booth*, 102 U.S. 96 (1880).

²² *Glagovsky v. Bowcraft*, 164 F. Supp. 189, 190, 1 Cir., 267 F. 2d 479 (1969), certiorari denied 361 U.S. 884.

²³ *Gray v. Eastman Kodak Co.*, 7 F. Supp. 321, 322, reversed 3 Cir. 67 F. 2d 190, 194 (1933). Though the Supreme Court reversed at 292 U.S. 332 (293 U.S. 628), it was only because of a defect in appellate procedure.

would have been *obvious* at the time the invention was made *to a person having ordinary skill* in the art to which said subject matter pertains.

This opinion has been reiterated recently by the Court of Customs and Patent Appeals ²⁴:

What amounts to patentable “invention” ... is simply whether the difference between what is claimed and the prior art would have been obvious to one of *ordinary skill* in the art at the time the invention was made.

Certainly this does not mean whether the invention may seem obvious to the court through hindsight.

The views of the late Judge Parker ²⁵, of the Court of Appeals for the Fourth Circuit, may be of interest:

The state of the prior art, the problem to which the invention was addressed, its success in solving the problem, its acceptance by the art, and its success commercially should be accorded more weight than what the judge, who is unfamiliar with the art or with the problems of industry generally, may chance to think, in the light of the problem’s solution, as to what one skilled in the art should have known or should have been able to do.

He went on:

And especially should the judge be on guard against permitting anticipation to be found in the bone yard of abandoned experiments and mere paper patents. In such case the searching and conclusive inquiry is: “If what has caused such a great change in the art and such an improvement in the industry was old and ready at hand, why did not it occur to someone else to use it?”

As one court of appeals ²⁶ remarked:

It is usually, if not indeed always, easy to discover a genesis somewhere for any patentee’s contribution. But if patents were to be held invalid on such reasoning, few would survive.

An invention, moreover, is always “simple” and “obvious” after it has been disclosed. The Supreme Court of an earlier era said ²⁷:

²⁴ *Application of Ruff and Dukeshire*, CCPA, 256 F. 2d 590, 598 (1958).

²⁵ “Recurrence of Fundamentals,” in *American Bar Association Journal*, Vol. 30, p. 623 (1944).

²⁶ *S.D. Warren Co. v Nashua Gummed and Coated Paper Co.*, 1 Cir., 205 F. 2d 602, 605 (1953).

²⁷ *Loom Co. v Higgins*, 105 U.S. 580, 591 (1854).

At this point we are constrained to say that we cannot yield our assent to the argument, that the combination of the different parts or elements for attaining the object in view was so obvious as to merit no title to invention. Now that it has succeeded, it may seem very plain to any one that he could have done it as well. This is often the case with inventions of the greatest merit. It may be laid down as a general rule, though perhaps not an invariable one, that if a new combination and arrangement of known elements produce a new and beneficial result, never attained before, it is evidence of invention.

The invention of the patent in suit in the *Barbed Wire Patent* case²⁸ lay in wrapping the barb several times around the carrier wire, so that a bearing was provided for the barb, which was thus held permanently at right angles to the carrier wire. The prior art disclosed the same barb, but without the bearing, so that it wobbled about the carrier wire instead of being held rigidly at right angles.

The Supreme Court remarked that “it may be strange” that this simple device was not “obvious.” Yet, “simple” and “obvious” as this improvement appeared in retrospect, it laid a foundation for accomplishing something that the prior art could not do. By the new barbed-wired invention, cattle could be kept within their wired enclosures.

A short time later²⁹, in sustaining a patent, the Supreme Court spoke of an invention that “appears to the ordinary mind so simple as to excite wonder that it was not thought of before.” And, still later³⁰:

Its simplicity should not blind us as to its character. Many things, and the patent laws abounds in illustrations, seem obvious after they have been done. . . . Knowledge after the event is always easy, and problems once solved present no difficulties.

The invention involved in the *Eibel Process* case³¹, in retrospect, was again “simple” and “obvious.” It merely raised slightly the rear end of the belt of the Fourdrinier papermaking machine, in order the the liquid pulp traveling thereon could move a little faster, by gravity. Small as the advance was, however, it was promptly adopted by the industry.

Again, the invention in the *Ray-O-Vac* case of the early 1940’s³² was “a very narrow one in a crowded art.” It consisted of enclosing a flashlight battery in a steel casing to render it leakproof. But this idea had never occurred (and hence manifestly was *not* obvious) to those persons (other than the inventor) “having ordinary skill in the art” who had long been troubled with the battery leakage.

²⁸143 U.S. 275, 283 (1892).

²⁹*Potts v. Creager*, 155 U.S. 597, 608 (1895).

³⁰*Diamond Rubber Co. of N. Y. v. Consolidated Rubber Tire Co.*, 220 U.S. 428, 434 (1911).

³¹*Eibel Process Co. v. Minnesota and Ontario Paper Co.*, 261 U.S. 45 (1923).

³²*Goodyear Tire and Rubber Co., Inc., v. Ray-O-Vac C.*, 321 U.S. 275, 279 (1944).

And so it would seem that honest adherence to the spirit and scope of the tests of Section 103 should go a long way toward stabilizing the ultimate test of patentable invention.

3.6 Statutory Presumption of Validity of a Patent

Numerous decisions indicate that, certainly as codified by Section 282 of the Patent Act of 1952,

a patent shall be presumed valid. The burden of establishing invalidity of a patent shall rest on a party asserting it.

The Supreme Court had previously held ³³ that “the burden of proof to make good this defense” is “upon the party setting it up,” and “every reasonable doubt should be resolved against him.”

But the courts of the mid-twentieth century have paid little attention to this presumption. As Judge Galston has said ³⁴,

in the last two decades, though courts had said prior thereto that patents were entitled to a presumption of validity, during the latter years only lip service has been given to that doctrine. Now it becomes clear that since there is a statutory presumption, it may not be ignored.

This policy followed the dissent in the early 1940’s of Mr. Justice Black ³⁵:

In the absence of a statutory prescription to the contrary, I see no reason for extending the presumption of validity arising from the mere issuance of a patent. . . .

Section 282 of the Patent Act of 1952 now provides that “statutory prescription.” The presumption is greatly increased, moreover, when the art cited by a defendant in an infringement suit is substantially the same as the art before the examiner in the Patent Office.

If it were not for prejudices in the field of patents, the trend of decisions in the administrative law field would seem to indicate that there *should be*, though there is not, a steadily growing tendency to follow the proposal of an earlier court of appeals ³⁶ in giving special weight to the use of skilled examiners in the Patent Office in determining patentability. Surely, by Section 282, Congress intended that patents should not be held invalid merely by “Monday-morning-quarterbacking.”

³³ *Radio Corp. of America v. Radio Engineering Laboratories Inc.*, 293 U.S. 1, 7 - 8 (1934).

³⁴ 13 F.R.D. 463, 469.

³⁵ *Williams Mfg. Co. v. United Shoe Machinery Corp.*, 316 U.S. 364, 392 (1942).

³⁶ *United Shoe Machinery Corp. v. Muther*, 1 Cir., 288, 287 (1923).

3.7 Commentary—The Case for Sympathetic Legal Recognition of Inventions

There is certainly a feeling in some judicial quarters that patents should not be granted for “gadgets” or trivial devices, as contrasted with such inventions as the atomic bomb; and perhaps this may seriously affect the construction put on the Patent Act of 1952.

This was certainly the public policy advocated by Mr. Justice Douglas in his opinion in the *A&P* case³⁷:

The patent involved in the present case belongs to this list of incredible patents which the Patent Office has spawned.

If I understand Mr. Justice Douglas correctly, he regards a patent for an everyday household item as an “incredible patent.” Certainly he so classified one for a collar. Apparently Mr. Justice Douglas views a collar as among “the simplest of devices,” one of a “host of gadgets,” for the improvement of which men should not be encouraged to devote their inventive faculties. This view, it should be observed, was merely Mr. Justice Douglas’s opinion, concurred in, at that time, by Mr. Justice Black and by no other justice.

The records show, however, that at another time a particular invention in a collar was important enough to revolutionize a whole industry, and a patent for it was sustained by one of our greatest judges, Learned Hand³⁸. Probably Justices Douglas and Black themselves have benefited by that very invention, for it is doubtful whether they still wear the prior-art collars. Furthermore, the Supreme Court itself has sustained a patent for a bare collar button³⁹, and many patents for articles of wearing apparel and other “gadgets” of considerable value to the public have heretofore been sustained.

As later will be made more evident, the part played by individual inventors and small companies in the development of such inventions is still great. And still pertinent is the unheeded call in late depression years of the then commissioner of patents, the Honorable Conway P. Coe:

What a patent issues to an inventor we purport to give him the right, the exclusive right, for a term of 17 years to prevent others from making, using, or selling the invention covered by it. But we say that with our tongue in our cheek, for we know better than he that by our present method of adjudicating patent rights he will find it exceedingly difficult to prevent the wrongful appropriation of his property and may be compelled to stand helpless while he is despoiled. . . .

My conviction is that the poor inventor, and through him the public, suffers injustice precisely for the reason and to the extent that the monopoly, the exclusive right, purportedly bestowed on him is

³⁷ *Great Atlantic and Pacific Tea Co. v. Supermarket Equipment Corp.*, 340 U.S. 147, 158 (1950).

³⁸ *Van Heusen Products, Inc. v. Earl and Wilson*, 300 F. 922, 925 (1924).

³⁹ *Krementz v. The S. Cottle Co.*, 148 U.S. 556 (1893).

not now fully safeguarded. What we need is not to decrease but to enhance the monopoly called a patent. Genuine protection in that form would be the last surviving bulwark standing between the inventor and the onslaught of mighty corporations.

A patent should function as a leveler whereby an individual or a company of small means may be enabled to hold his or its rights of property against the pressure of the strongest adversary. It should have a protective character like that of a high-power rifle in the hands of a puny man beset by a wildly charging bull elephant. Unfortunately, that patent affords no safeguards. . . .

The patent system of the United States, more than any other in the world, offers hope, encouragement, opportunity and recompense to an individual or a company of small resources. It is as democratic as the Constitution which begot it.

Congress has recognized this problem at least partially and has tried to solve it. The Patent Act of 1952, it is to be hoped, has restored the standard of invention at least to what it was originally and continued to be up to very recent years. If questions of public policy are involved, therefore, Congress has made plain that its purpose in enacting the new Patent Act was to remove the discouragement of inventors induced by prior decisions of the courts.

Particularly in view of the extremely large number of important and breakthrough inventions that still flow from independent inventors and small companies⁴⁰, we cannot sit back and merely wait for the fruits of government-sponsored and large-corporation research. Never before in modern history has America been threatened so seriously from abroad – both economically and militarily – and hence never before has it needed so desperately to encourage invention from *all* quarters.

With the same end in view of encouraging invention, Congress, in 1954, in Section 1235 of the Internal Revenue Code, allowed capital-gains tax treatment to professional inventors and their backers, under certain circumstances, while discriminating against authors. Recent interview studies of independent inventors, conducted under the auspices of The Academy of Applied Science at Cambridge, Massachusetts, revealed fully the error of the Treasury Department's proposed repeal of this Section 1235 together with the removal of sales of patents by an inventor (even an amateur inventor) from possible capital gains treatment⁴¹.

Now these independent inventors represented a wide range of experience in innovation engaged in from six to more than forty years. Their more important inventions included: methods of calibrating D.C. instruments; magnetic amplified control systems; mechanical-electrical transducers; systems to convert capacitance changes to output voltages; shades that keep out heat but let in sunlight; inventions in image intensification; medical instruments; *methods*

⁴⁰Donald A. Schon, "Champions for Radical New Inventions," *Harvard Business Review*, Vol. 41, No. 2, p. 77 (1963).

⁴¹"Angry Inventors," in *Wall Street Journal*, May 10, 1963.

of compacting continuously sheet materials at a high rate of speed – used in paper, textiles, and plastics; *the fuel oil whistle*; gasoline tank design; reverberation devices for sound; UHF tuner; electric motors; *broad-band amplifiers*; *power steering*; *the RC oscillator*; the dynamic noise suppressor; *stereo amplification systems*; *the hydrogen thyratron*; *cryotrons*; flash lamps; electron tubes; cathode-ray tube displays for analog computers; high-vacuum apparatus; gauge calibration equipment; pressure and temperature sensitive switches – widely used in space vehicles. (The inventions which I have italicized have revolutionized industries.)

Most of these inventors sell or exclusively license their inventions, thereby placing themselves under the capital-gains category of Section 1235; or they own their own companies, which in most cases have been built around one or more of their own inventions, with the capital-gains provision used to build up the company. Their technically successful inventions ranged from about 20 to 80 per cent, with a mean about one in three. Of these, only about one in five has been a substantial income-producer to the inventor; the average yearly return from licensing or selling inventions being from \$10,000 to \$50,000.

The average time lag between the making of an invention and the receipt of returns therefrom was five years; and more than half of all the commercially successful inventions had to be pioneered on the market by the inventor himself before others could be persuaded to adopt them. Only one of these inventors received any financial backing from a government contract in the making of his inventions.

The inventors interviewed, moreover, had not only provided the country with many new products and processes, but had, in the process, created thousands of new jobs, and tens of millions of dollars of new sales. Dare we risk discouraging this well of *current* invention by making an already highly dangerous and speculative profession untenable to pursue⁴². Unsympathetic decisions by the courts or administrative agencies can only negate the policy of Congress which would encourage inventors to continue to invent and businessmen to take risks on the development of invention.

⁴²Benjamin F. Miessner, "Today's Inventor – A Study in Frustration," in *American Engineer*, Vol. 33, No. 4, pp. 38 - 40 (1963).

CHAPTER 4

PATENTS IN ACTION (THE HISTORY OF THE BASIC TELEPHONE PATENT)

This chapter carries an illustrative approach found most effective in lecturing, tying together a complete picture of the invention, entrepreuring, business, and legal cycles often involved in innovation – and through the medium of the *Bell Telephone Cases*. This particular invention was selected because its technology is familiar to all types of reader and because almost everything that could happen did happen to Bell; except that he was saved by a single vote in the Supreme Court from the anonymity experienced by many current inventors.

By turning to a detailed study of the so-called *Bell Telephone Cases*, involving an invention understandable and intimately known by everyone ¹, we can both tie together many of the various principles of patent law heretofore discussed, and set up a real laboratory experiment by which to observe the rather typical actions and reactions of American industry and business to independent innovation. In this way we can learn something about the intricacies and mysteries of patent litigation in the courts.

4.1 The Circumstances Underlying Bell's Invention

A little, first, about Alexander Graham Bell. He was not a native-born American ². This has some significance for what happened in this case. At the time here involved, only American citizens could file an intention, called a "caveat," and file later a patent application for an invention. If the caveat was seasonably followed by a patent application, the inventor could thereby obtain the benefit of the early date of the caveat filing. Had Bell been an American citizen with

¹Frederick V. Hunt, *Electroacoustics*, Harvard Monographs in Applied Science, No. 5, Harvard University Press and John Wiley & Sons, Inc., 1954, pp. 23-25.

²The large number of basic inventions heretofore made by foreign-born Americans should give us cause for concern in light of present-day security restrictions and their effect upon the encouragement of invention

the right to file a caveat, certain alleged prior inventions by others could not have been asserted against his claim of prior inventorship. Bell had to wait until he had completed his inventive processes, at least theoretically, before he could file his application in the Patent Office.

Bell was born on March 3, 1847, in Edinburgh, the son of a teacher of elocution. At a very early age, he naturally became interested in the problems of speech and lip reading and ultimately assisted his father, who was the professor of elocution at the University of London. When the latter was offered a position in this country, he sent his son, in his stead, to join the staff of the Boston School for the Deaf.

At this time, the Western Union Company, having bought up the small individual operating telegraph systems in the country, was in control of the country's first national communications chain. One of the problems that it was facing was that of the simultaneous transmission of a plurality of Morse-code messages over the same wires. Its engineers were heavily engaged in trying to solve this problem. Bell heard about it, became interested, and decided to set out to solve it. Fortunately, in his impecunious state, he met a Boston attorney, Gardner Greene Hubbard, who, becoming intrigued with the potential financial return from an invention that could solve this problem, agreed to supply funds with which Bell could carry on his researches.

The concept that Bell evolved related to the simultaneous transmission of a plurality of different tones, each carrying a different telegraph message. At the receiving end, a number of tuned reeds were provided, each tuned to one of the different tones. Bell reasoned that only the reed tuned to a particular tone would reproduce that tone, and so each message would be selectively received by its corresponding reed.

It is important for our purposes to remember that this multiple-telegraphy problem, called the "harmonic telegraph," was the concept that Bell set out to explore. This is important because it illustrates what often happens when an inventor or applied scientist sets out to solve a problem. Frequently, the investigator makes an accidental auxiliary discovery or observes some phenomenon he cannot explain. When given the freedom to drop the planned research goal for the moment and to explore this diversion, inventors have made far more important inventions than the original research project contemplated, devices that solved different and often more important problems. There is the serious question whether today, under government sponsorship of research, and even under the research policies of many industrial companies, the investigator would have that freedom to stop momentarily, to lay aside the original goal, and to explore the striking new channel.

Bell was joined in his experiments by Thomas A. Watson, and the two worked together in a garret, as the popular story has it, on the harmonic telegraph. One day Watson misadjusted a reed, so that instead of vibrating back and forth, to make and break an electrical circuit and thereby to reproduce the telegraphic dot-and-dash message, the reed became stuck fast in a closed-circuit position. Bell, being in the room at the time, heard something he had never heard before, a kind of muffled tone of entirely different quality and clarity from the ringing

tones of make-and-break reeds. He was puzzled as to how, in a completely closed circuit, the tone could be reproduced. This was perhaps the first inkling that communication results could be obtained other than by making and breaking electrical circuits. Here was a tone that was coming through when the circuit remained closed, the stuck reed apparently responding to current variations in the winding behind it. Mind you, Bell was still working on this harmonic-telegraph problem.

At this point, however, realizing the significance of this discovery, Bell went to Mr. Hubbard and requested permission to stop work on the harmonic telegraph, and to start investigating the problems inherent in speech reproduction. Mr. Hubbard, interested in the big bounty awaiting the first person to solve Western Union's problem of multiple telegraphy, was unable to see any future in a speech machine, and so repeatedly instructed Bell to continue on the harmonic telegraph and to forget esoteric speech problems. The record shows, however, that Bell slanted his work towards a speech machine, under the guise of a modified version of the harmonic telegraph.

On February 14, 1876, Bell filed a patent application. This application purported to cover the harmonic telegraph for simultaneously producing multiple-tone messages. The application clearly explained, however, that it covered also a machine that would reproduce vocal sounds. Bell put both inventions in one case. On March 7, less than one month later, the Patent Office issued the first Bell patent on that application. The patent number was 174,465. Note that it took Bell less than a month to get his patent. Contrast that with the several years that may be involved in issuing a patent today, particularly in the light of the events to be subsequently related, where others soon commenced to violate Bell's rights. At least Bell, unlike a present-day inventor, promptly obtained a patent that enabled him to try to enforce his rights, instead of having to sit back and wait in frustration. Here is the fortuitous circumstance that Bell obtained his patent promptly.

4.2 Bell's Basic Patent

Figure 2 reproduces part of the basic Bell patent relating to the original telephone, with Fig. 7 thereof illustrating a mouthpiece at A, into which the voice sounds were to be directed. There was a metal diaphragm *a* that would vibrate in accordance with those voice sounds. Behind the diaphragm *a* was an electromagnetic winding *b* that was connected in the following electrical circuit: from ground *E*, through a battery, to and through the winding *b*, along the line *e*, to a similar receiving winding *f*, and then back to ground again, at *g*. Thus there is provided a closed circuit for the flow of electric current. In this patent, Bell explained that as the diaphragm *a* moved closer to and farther away from the winding *b*, in response to voice vibrations, the effect of its varying position, relative to the winding *b*, would be able to induce, in this winding *b*, variations in the current flowing therein. By this technique, the exact undulations of sound produced by the voice can be converted into corresponding electric current undulations or variations in the above-mentioned circuitry. The receiving or

reproducing diaphragm i would thus be attracted to and repelled from the receiving winding f , causing air in front of the diaphragm i to be correspondingly set into vibration, thereby to reproduce the original voice sound.

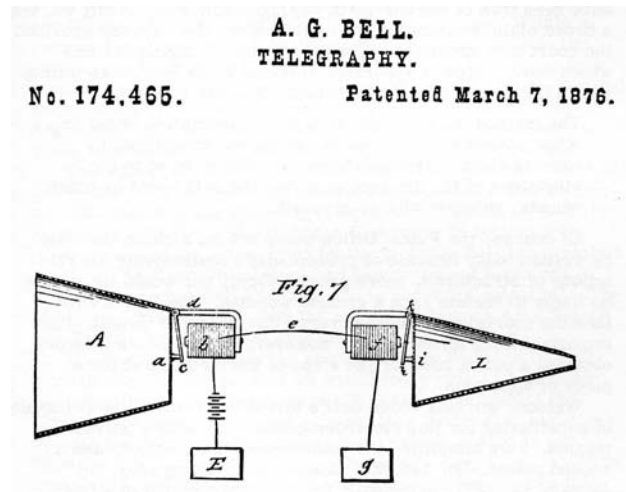


Fig. 4.1: Part of Bell's original telephone patent. (This image is public domain and is not protected by copyright.)

Now this is the theory that Bell proposed in his patent. The evidence adduced in subsequent litigation involving his patent demonstrated that Bell had never made this device work for voice sounds until *after* he had received his patent. It is important to note, however, that he did have a valid theory of operation. More of this later.

His attorney presented two kinds of claims in the patent. It is to be recalled that one of the patentable classes of invention is a new piece of apparatus, which may be a new combination of old elements, operating in a new cooperative manner to achieve a new result. It will be recalled, also, that the law permits the patenting of a new process or art or method, namely a new series of steps capable of performance with any of a host of different types of apparatus. The concept that Bell had evolved was a method wherein a continuous electric current was to be maintained, but whose value was to be changed in accordance with voice-sound undulations, and without interrupting the complete-circuit flow of the current. That, Bell asserted, was his new method. His attorney worded the claims in both method and apparatus form, and it is wise that he did so. It will be demonstrated shortly that, had he worded the claims in specific apparatus form alone, some of Bell's early competitors might have been free of the charge of infringement. But, having worded a broad claim to embrace the method also, the attorney provided the court with grounds for construing the infringing devices, which were pieces of apparatus different from Bell's, as falling within the scope of Bell's invention. To quote claim 5:

The method of, and apparatus for, transmitting vocal or other sounds telegraphically, as herein described, by causing electrical undulations, similar in form to the vibrations of the air accompanying the said vocal or other sounds, substantially as set forth.

Of course, the Patent Office would not let a claim like that be written today because of present-day requirements for the recitations of structure in more precise form, nor would the courts be likely to sustain such a general wording. The Patent Office (and the courts) have become very ritualistic and formal. The important thing for our story, however, is that Bell's attorney obtained a patent both for the steps of the method and for a piece of apparatus.

Watson, working under Bell's direction, evolved the principle of substituting for this electromagnetic apparatus a permanent magnet. This simplified the commercial construction, a second patent, No. 186,787, issued the following year, on January 30, 1877, principally for the improvement of a fixed magnet.

Bell, still struggling under the adverse conditions usually besetting the individual inventor and entrepreneur, did the natural thing. He went to Western Union, the party most interested in communications, and offered his basic patent for the telephone for \$100,000. Western Union, in turn, consulted with the ablest scientific people and engineers and the best business minds of that day and came to the conclusion that there was no commercial future for an instrument that would reproduce voice sounds. Hence, it turned down Bell's offer³.

It may be interesting to depart briefly from the main theme to point out that the supposedly ablest industrial, scientific, and government people of our own day make similar unimaginative decisions over and over again. Where inventors formerly persisted and proceeded somehow on their own, as did Bell, in the true American tradition, and sometimes made a success of their inventions to the benefit of the country, the recent policies of our government, our industry, and our courts, as will be shown later, have tended to kill or at least hamper much of the incentive.

4.3 The Founding of Bell's Company – and the Pirates

In Bell's day, however, the American pioneering spirit still existed, and Bell, unthwarted, determined to promote his invention himself. He and his associates raised capital in Boston and formed the American Bell Telephone Company. Within a year or two, they were actually supplying instruments to the public. Having now embarked upon a business, as distinguished from a research venture, Bell needed to and did obtain practical improvement patents for commercially acceptable structures. And the demand for these crude telephone instruments was so great that the new company could not keep up with its orders.

Two short years later, in 1879 (once Bell had shown the way) the Western Union reversed its decision that there was no commercial future in the speaking

³The technical and financial advisers to industrialist Chauncey Depew were instrumental in the later turn-down of an offer of a one-third interest in Bell's enterprise for the sum of \$10,000.

telegraph toy, and it formed the American Speaking and Telephone Company. In typical free-enterprise fashion, stimulated by the fact that Bell had obtained a patent, Western Union employed two renowned inventors to work around what Bell had done and to avoid his patent⁴. The whole world is familiar with the names of Thomas Alva Edison and Elisha Gray, the men selected by Western Union.

Thomas Edison, upon his employment by Western Union, went to work to devise what we would today call a transducer for using the voice vibrations to affect the magnitude of the electric current far more effectively than Bell's did, and came up with the carbon-button microphone, which is still in use. Western Union, accordingly, treated Bell's patent as limited to armatures and diaphragms and put on the market its own telephone, using Edison's invention. This carbon-button microphone performed infinitely better than did Bell's crude electromagnetic device, so that the quality of the Western Union instrument was far above that of the American Bell Telephone Company's. One can begin to see the problem facing the latter company when customers could obtain a much improved instrument from its competitor.

To solve this, Bell's company decided to employ inventors other than Bell, in an effort to produce as good an instrument as Edison's carbon-button microphone. They therefore hired Emil Berliner, who had effected a filing in the Patent Office two weeks earlier than Edison's patent application for the carbon-button microphone. (And this was, of course, one of the reasons why he was selected.) While Berliner did not invent a carbon-button microphone, he did devise a type of metal-contact microphone that could be termed a variable-resistance microphone. This was an apparatus operating upon a different physical principal (variable resistance) from that of Bell's inductive armature-diaphragm apparatus, and, if new, was entitled to independent patent protection. The significance of this is that, since variable resistance is also the principle underlying the operating of the Edison carbon-button microphone, if Berliner could obtain broad patent claims to a variable-resistance microphone, the Bell Company would have another tool with which to ward off Western Union's challenge.

The Patent Office set up an interference proceeding between Berliner and Edison to determine which was entitled to the broad variable-resistance-microphone claims. It is interesting to observe that years later, when Berliner's patent finally issued, it had the effect of extending the basic "monopoly," as that term is popularly used, of the American Bell Telephone Company. The patent was attacked unsuccessfully upon the ground of extension of monopoly by the Attorney General⁵, though later it was invalidated by the Circuit Court for the District of Massachusetts as anticipated by Edison's work⁶.

The American Bell Telephone Company held the view that Bell's basic patent was very broad and was not restricted to any particular form of appara-

⁴History shows over and over again that, far from stifling progress, the granting of important patents causes industry to look for alternative approaches in an effort to avoid the patent, thereby further promoting the progress of the useful arts.

⁵*United States v. American Bell Telephone Co. & Emil Berliner*, 167 U.S. 244 (1897).

⁶109 F. 976 (1901).

tus. Under such interpretation, of course, a telephone using Edison's improved transducer, the carbon-button microphone, would infringe the broad telephone claims of Bell's patent. Bell could not, therefore, stand by and sanction the Western Union infringement upon his patent. Claim 5 of the basic patent, quoted earlier, does not specify whether the electrical undulations similar in form to the vibrations of the air are caused by use of a variable resistance or by use of a magnetic armature circuit, but very broadly covers that they are made to do so. Thus, on the theory that this broad claim covered any way found to do this equivalent to Bell's disclosed magnetic armature-diaphragm apparatus, American Bell Telephone Company sued Western Union.

I have said nothing yet about Elisha Gray, who, like Edison, had been employed as an inventor by Western Union. One of the reasons for his employment was that on the very same day, February 14, 1876, that Alexander Graham Bell had filed his patent application for the basic patent, Elisha Gray, an American citizen, had filed in the Patent Office a caveat for a telephone. He had apparently independently conceived the idea of having a closed circuit and of varying the value of the current therein, in accordance with voice sounds. (See Figure 3.) As the voice vibrations moved a diaphragm *a* (Fig. 1) back and forth, a wire *A* was simultaneously inserted to varying depths into a conducting water solution *B*. Hence, in theory, the resistance between the wire *A* in the water and water solution *B* varied because there was more or less contact area between the wire and the water. This, then, was a variable-resistance device, moving back and forth in the same way as the air undulations, in an uninterrupted electrical circuit. But Gray did not follow up this caveat with a patent application, and his rights were accordingly lost. He was still useful to Western Union, however, because, whether or not he obtained a patent, Bell's patent could be invalidated if Gray had actually made the invention before Bell. There was also a charge of fraud raised in the *Telephone Cases* to the effect that word of Gray's caveat was passed to Bell's attorney, and that the latter supposedly arranged for Bell's application to be changed in the Patent Office to include Gray's variable-resistance principle, but the Supreme Court found no evidence at all of such fraud.

A great deal of testimony was taken in the suit between Bell Telephone and Western Union, and the attorneys for the latter advised their client that they thought Bell was going to win the case. Since they had an interference in the Patent Office, *Edison v. Berliner*, on the broad variable-resistance issue, and since they had this court litigation on the basic Bell patent, Western Union decided to see if a compromise could be reached. It should be added that, although Western Union had infringed Bell's claim 5, the Bell Company, on the other hand, could not operate commercially without using Edison's carbon-button microphone invention. In other words, the Western Union attorneys were sure they would lose their suit, but Bell was also anxious to settle it to obtain the rights under Edison's invention.

Accordingly, a settlement was reached on the basis that, for a period of seventeen years, the American Bell Telephone Company would pay one-fifth of all its proceeds to Western Union, Western Union would give the rest of its stock of telephone equipment to the America Bell Telephone Company, and

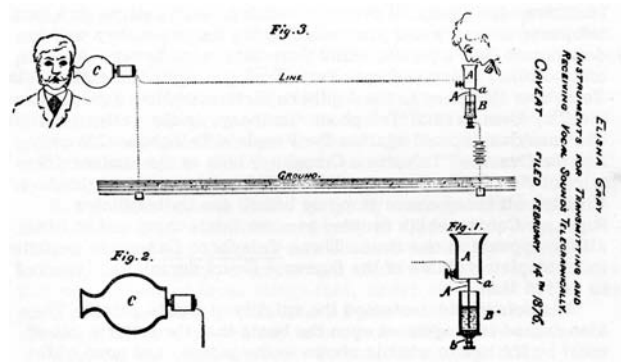


Fig. 4.2: A part of Elisha Gray's caveat. (This image is public domain and is not protected by copyright.)

from that time on Western Union would not engage in the telephone business for the seventeen-year period. This, of course, was a business decision, forced perhaps by the patent difficulties. It certainly stands out, however, as one of the most fateful management decisions imaginable. Looked at with hindsight, it was responsible for the subsequent decline of Western Union.

4.4 Enters the Supreme Court

After the court litigation with Western Union was settled, other equally ambitious entrepreneurs, in the normal American tradition, sprang up all over the country, each setting up a small telephone company and proceeding along its own merry way in defiance of Bell's patent. Suits were thereupon brought against one Dolbear, a professor at Tufts College, against the Molecular Telephone Company in the southern district of New York, against the Clay Commercial Telephone Company, in the eastern district of Pennsylvania, and against the People's Telephone Company and the Overland Telephone Company, both in the southern district of New York. In each suit, Bell's patent was sustained. Finally, all these cases came up before the United States Supreme Court, which decided to consolidate them and to hear all the appeals at one time. These *Telephone Cases* are reported in a complete volume of the Supreme Court decisions, referred to as 126 U.S.

The defendants contested the validity of Bell's patent. They also denied infringement upon the basis that the latter's patent must be limited to what is shown in the patent, and none of the supposedly infringing telephones used the magnetic armature-diaphragm apparatus of the patent. I shall now examine how the Supreme Court treated these various defenses, and what its decisions were.

First of all, the reader may gain a picture of how close to the prior art important inventions often are, by learning that these defendants cited some fifteen different men who, they maintained, made this invention before Bell.

They included a Philip Reis of Germany, the before-mentioned Elisha Gray and Thomas Edison, Professor Dolbear, and one Daniel Drawbaugh. The defendants also asserted that there were eight United States patents, six British patents, and a French one, all issued before Bell's basic patent and disclosing the same invention. The defendants alleged, further, that there were six United States patents, three British patents, and a Canadian one for the same invention as Bell's second improvement patent, before mentioned. They cited some sixty-three publications before Bell's, including French, British, German, United States, Italian, and Irish publications, all supposedly anticipating Bell's concept. And in connection with the latter's second patent, they listed fifty-one publications to show that others had thought of the invention before Bell.

Now these were technical people, applied scientists, business people, and attorneys, who were advancing rational arguments; they were trying to persuade a court that Bell's contribution was anticipated. I proceed, therefore, to the details of these defenses and how the court handled them.

The first defense here involved is that Bell was attempting to patent a natural force, a scientific fact. He was purporting, in claim 5, to monopolize the scientific fact that, if one varies the electric current in the same way that the sound produced by the voice varies, speech will be reproduced. This, the defendants maintained, is a fact of nature to which our patent laws do not extend. And they cited a Supreme Court decision to support that principle, *O'Reilly v. Morse* (15 How. 62). In that case, Samuel F. B. Morse, the inventor of the telegraph, tried to claim all uses of electricity for transmitting intelligence from one point to another. The Supreme Court there held that an attempt to patent all such possible uses of electricity is too broad and is really an attempt to patent a force of nature. The court struck down Morse's broadest claim, claim 8.

So the defendants in Bell's suits, by analogy, argued that Bell's claim 5 gave him the monopoly of all possible ways of making these electrical currents correspond to the voice undulations, and, as such, represented merely a discovery of nature that was not one of those things that, under our patent laws, was susceptible to patent protection. As previously explained, a scientific discovery, per se, is not patentable under our laws.

What did the court answer? To quote from page 534:

In *O'Reilly v. Morse*, 15 How. 62, it was decided that a claim in broad terms (p. 86) for the use of the motive power of the electric or galvanic current called 'electromagnetism,' however developed, for making or printing intelligible characters, letters or signs . . . was void, because (p. 20) it was a claim for a patent for an effect produced by the use of electromagnetism, distinct from the process or machinery necessary to produce it.

The court continued that in Bell's case, on the other hand,

the claim is not for the use of a current of electricity in its natural state as it comes from the battery, but for putting a continuous

current in a closed circuit into a certain specified condition suited to the transmission of vocal and other sounds, and using it in that condition for that purpose.

The court was not unmindful of the fact that

it may be that electricity cannot be used at all for the transmission of speech except in the way Bell has discovered, and that, therefore, practically, his patent gives him exclusive use for that purpose, but that does not make his claim one for the use of electricity distinct from the particular process with which it is connected in his patent. It will, it is true, show more clearly the great importance of his discovery, but it will not invalidate his patent.

Hence, concluded the Supreme Court, this is not a case where Bell is taking raw nature, the force of a battery, the force of a current, and trying to claim all uses of it for speech reproduction. This is a case, rather, where Bell is molding the current into something that was not there originally, and varying that current in accordance with the variation of air pressure produced by voice sounds. This is a method or process. It is not pure scientific discovery. It is, rather, the application of scientific discovery to a particular problem. It is the kind of invention that our patent laws cover.

The next defense advanced was that Bell did not really make his invention work until *after* his patent issued. It will be recalled that Bell had witnessed the experiment of the stuck reed, but that was not voice. He had not actually transmitted voice at that time, and, in fact, he did not succeed in doing so until *after* his basic patent issued. So, said the defendants, Bell did not really make the invention until after he had obtained the patent.

How did the court answer that? To quote from page 535:

It is quite true that when Bell applied for his patent he had never actually transmitted telegraphically spoken words so that they could be distinctly heard and understood at the receiving end, but,

the court continued – and this is very important –

in his specification he did describe accurately and with admirable clearness his process, that is to say, the exact electrical condition that must be created to accomplish his purpose, and he also described, with sufficient precision to enable one of ordinary skill in such matters to make it, a form of apparatus which, if used in the way pointed out, would produce the required effect, receive the words, and carry them to and deliver them at the appointed place.

The court concluded on that topic (p. 536)

The law does not require that a discoverer or inventor, in order to get a patent for a process, must have succeeded in bringing his art

to the highest degree of perfection. It is enough if he describes his method with sufficient clearness and precision to enable those skilled in the matter to understand what the process is, and if he points out some practical way of putting it into operation. This Bell did.

Hence arises the rule of law, previously treated, that the filing of a theoretically operative patent application constitutes, in contemplation of the law, a constructive reduction to practice of that invention. An inventor does not need to wait until he can accumulate the several million dollars necessary to build a computer and test it. If he has some new principles that are worthy of protection and he can theoretically demonstrate their operability, he can obtain a patent.

The next defense advanced was that there was no infringement because, as earlier pointed out, claim 5 of that patent called for the apparatus “substantially as set forth.” Bell set forth an electromagnetic armature-diaphragm microphone. The defendants maintained that they were not using those electromagnets. Professor Dolbear⁷, for example, employed a microphone that appears to resemble what we would now describe as an electrostatic microphone, acting as a variable impedance in the circuit. This defendant’s position was that his apparatus, which was restricted to inducing current variations by moving the diaphragm nearer to and farther from the electromagnetic winding.

The court dealt with this defense of noninfringement as follows (p. 538):

The patent is both for the magneto and variable resistance *methods* and for the particular magneto *apparatus* which is described, or is equivalent.

What the court is saying here is that, insofar as the method is concerned, it may be practiced whether one uses a magneto, meaning the Bell electromagnetic armature-diaphragm structure, or a variable-resistance device. The use of either device still involves the method of causing the electric current to vary with the voice-sound undulations. As for the apparatus, however, the court agreed that the apparatus described in the patent claim was only the magnetic armature-diaphragm apparatus that Bell disclosed, or its equivalent. While it is not clear, the court later appeared to imply that the variable-resistance device was also an equivalent of the “magneto.” At any rate, it can be seen how important was the decision by Bell’s attorney to insert the magic word “method,” as well as apparatus, in the claim.

To continue with the court’s analysis:

It is undoubtedly true that when Bell got his patent he thought the magneto method was the best. Indeed, he said, in express terms, he preferred it, but that does not exclude the use of the other if it turns out to be the most desirable way of using the process under any

⁷ *United States Letters Patents* Nos. 239, 742 and 240, 518, issued April 5 and 26, 1881, respectively.

circumstance. Both forms of apparatus operate on a closed circuit by gradual changes of intensity, and not by alternately making and breaking the circuit.

It will be apparent hereinafter that the prior art came very close to Bell. The whole distinction was that, instead of keeping the circuit closed all the time, and varying the current in it, the prior-art inventors interrupted the circuit, by actually make-and-break switching, which was unable to reproduce complex waveforms, such as speech, although it could reproduce musical tones.

The court concluded (p. 539):

Surely a patent for such a discovery is not to be confined to the mere means he improvised to prove the reality of its conception.

Hence, another important point of patent law. If an invention is a broad invention, a court could construe it broadly. If the advance is a pioneer advance, one cannot escape infringement by trying to obtain the same result in another equivalent way. This matter of range of equivalents returns again to the matter of the attitude of the court and its conclusion as to the scope of an invention. If a court considers that a real advance has been made, and that the defendant is using the substance of the invention, the range of equivalents may be broad. If, on the other hand, a court considers the invention to be narrow, it may find the somewhat different structures of the defendant to be noninfringing, by refusing to grant a substantial range of equivalent structures.

Now I come to the details of the prior art set up by the defendants as anticipating Bell's invention. One of the prior-art publications was that of Bourseul in Paris, in 1854. This, it should be understood, was twenty-two years before Bell's invention. Here is what the Supreme Court held that Bourseul had in mind (p. 542):

As early as 1854 Bourseul, in his communication which has already been referred to, had said, substantially, that if the vibrations of air produced by the human voice in articulate speech could be reproduced by means of electricity, at a distance, the speech itself would be reproduced and heard there. As a means of stimulating inquiry to that end he called attention to the principle on which the electric telegraph was based and suggested an application of that principle to such a purpose. He said "...Suppose that a man speaks nears a movable disk, sufficiently flexible to lose none of the vibrations of the voice, that this disk alternately makes and breaks connections with a battery, you have at a distance another disk which will simultaneously execute the same vibrations."

This operation is show in Figure 4.

Bourseul, however, was merely proposing a problem insofar as speech was concerned. He had everything there – almost. He was even proposing to use the principle of the telegraph to make the electric current vary the same way that

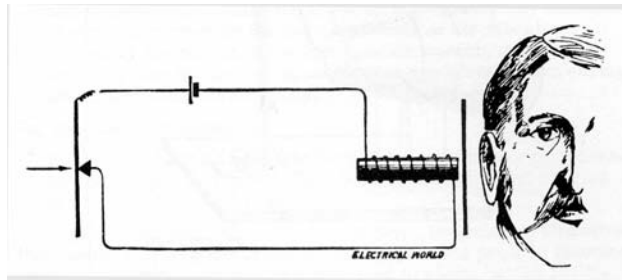


Fig. 4.3: Bourseul's make-and-break concept. (This image is public domain and is not protected by copyright.)

the voice vibrations vary. But note that he had in mind making and breaking the electrical circuit.

The next prior art was that of Philip Reis of Germany, some fifteen years before Bell made his invention. Reis's work involved a device for reproducing musical sounds wherein a diaphragm moved back and forth in response to sound waves, and caused an arm correspondingly to move back and forth and make and break the connection with an electric circuit. The Supreme Court invited attention to Reis's own description of his apparatus as involving a system wherein "each sound wave causes a breaking and closing of the current." Figure 5 illustrates the Reis construction, as shown in a paper of von Legat, embodying a diaphragm *c* that moves an arm *e* into and out of contact with a contact point *d*. The screw *h* can adjust the extent of this make-and-break adjustment. It could even produce Bell's kind of operation, if properly adjusted to that the circuit did *not* make and break, but gave rise to a variable-contact resistance phenomenon. This was proved by the experiments of Blake ⁸.

⁸126 U.S. 196.

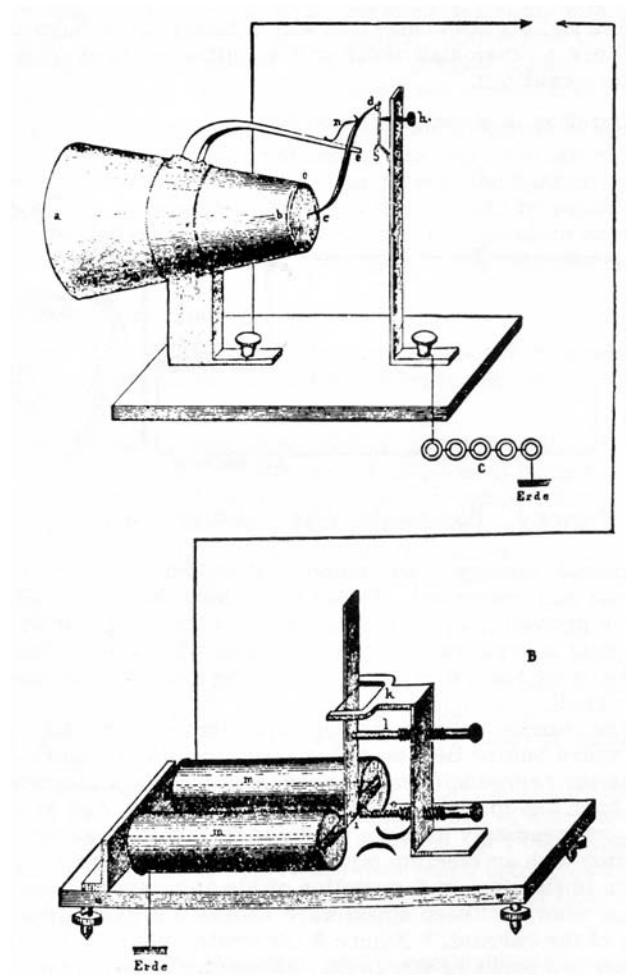


Fig. 4.4: Philip Reis's construction. (This image is public domain and is not protected by copyright.)

Professor Hunt ⁹ has an extremely interesting account of Reis's work in his book already cited. Here briefly is his conclusion, as a scientist, as to the nature of Reis's work.

In spite of stout efforts to show the contrary, no evidence could be found in Reis's writings that he had ever contemplated any mode of operation of his transmitter other than one involving complete interruption of the current. What made this conclusion convincing was the additional fact that his receiver was so insensitive that it could not have produced an audible reproduction of speech even when his transmitter was in the rare condition of adjustment necessary for the production of an undulating current.

The Supreme Court summarized Reis's work as follows (p. 544):

It was left for Bell to discover that the failure was due not to workmanship but to the principle which was adopted as the basis of what had to be done. He found that what he called the intermittent current – one caused by alternately opening and closing the circuit – could not be made under any circumstances to reproduce the delicate forms of air vibrations caused by the human voice in articulate speech, but that the true way was to operate on unbroken current by increasing and diminishing its intensity.

So, the court concluded,

if Reis had kept on he might have found out the way to succeed, but he stopped and failed. Bell took up his work and carried it on to a successful result.

Lastly, with regard to the alleged prior investigation of Drawbaugh, the People's Telephone Company came upon this prolific inventor who, long after the event, was prepared to claim having built a large number of telephones before Bell. For some unexplained reason, he only had bits and pieces of them to show, none of which worked. But he produced some fifty witnesses, farmers and the like, all of whom swore that they had heard speech coming over these various instruments long before Bell made his invention. In view of other circumstances the majority of the court just could not believe this. While Drawbaugh had indicated that he did not have money to file patents and that he did not realize in time the significance of the invention, the court found that he had been able to raise money to file patents on other inventions, that he had gone with friends to a centennial exhibition at which Bell made a demonstration, and had seen Bell's instrument, but never claimed to his friends that he had already done the same. This distinct feeling of prior inventorship was apparently not brought out in Drawbaugh until after the People's Telephone Company had considered him as a possible champion by whom to defeat Bell. The majority of the court

⁹Frederick V. Hunt, *Electroacoustics*, p. 28.

found that Drawbaugh did not make the invention before Bell, although three judges disagreed. So, by a 4-to-3 vote, two of the judges not participating, Bell's patent was sustained by the Supreme Court.

It may be relevant to point out that four days after delivering the majority opinion Chief Justice Waite died. What would have happened to Bell's patent without the persuasion of Chief Justice Waite? Suppose he had died a little earlier? Would there have been a 3-to-3 sustaining of the patent, or would no American schoolchild today know of Alexander Graham Bell?

Another point of interest is the reluctance of the courts to trust oral testimony, alone, with regard to dates of invention and demonstration¹⁰. If Drawbaugh had made the invention and had kept proper written records and models, these, together with the attestations of technically qualified witnesses, would have undoubtedly led the majority of the court to a different conclusion¹¹. This is a lesson for the applied scientist and inventor on the importance of keeping dated records and models and having them witnessed by those who understand the invention.

Another interesting fact is that Bell's invention gave rise to a situation whereby, within the quarter of a century following it, more than 3000 patents are reported to have been issued for improvements relating to the telephone.

Supposedly informed and well-meaning people have sometimes attacked that patent system as discouraging invention, because the pioneer gets a basic patent and can, for a limited time, exclude others. The history of patents shows, however, that, far from discouraging invention, the system fosters and stimulates a myriad of new devices to get around the patent or to improve upon it, in order to bargain for an exchange or rights, as demonstrated above. Truly this accomplishes the end set forth in the Constitution "to promote the progress of science and useful arts."

It is of interest, also, to note the considered opinion of Professor Edward L. Bowles, of the Massachusetts Institute of Technology, who has made a deep study of the history of the American Telephone Company and its subsidiaries. Professor Bowles has reason to believe that the Telephone Company policy, with regard to equipment ownership, may well have resulted from the influence of the equipment-leasing policy of the United Shoe Machinery Corporation. It appears that, while Bell has sometimes been credited with altruism in establishing the policy of not requiring the telephone user to own his equipment, his financial backer, G. G. Hubbard, was a close associate of Gordon McKay, the former guiding light of the United Shoe Machinery Corporation and its policy of leasing, not selling, equipment.

¹⁰See also *American Optical Co. et al v. Shuron Optical Co.*, 9 F. 2d 932, 936.

¹¹There is always a question, however, whether it is in the public interest to give effect to an alleged prior invention that is suppressed or concealed or put aside and ignored. Does this "promote the progress of useful arts"? See, for example, *Mason v. Hepburn*, 84 O.G. 147.

4.5 How Would Our Present Supreme Court Probably React to Bell's Patent?

What might have been Bell's fate if he had to come before our Supreme Court today? We must assume, of course, that he had already obtained his patent, and had not already been worn out by interferences, in the Patent Office, with one or more large corporations. As I shall show, later, such corporations have been notorious for provoking interferences by unwarrantably reading into one of their thousands of applications on file in the Patent Office an invention of an outsider that has come to their attention, and that they fear they might want to use later. We must also assume that the patent has issued relatively promptly, so that well-financed copyists have not already been able to put the enterprising inventor out of business.

For purposes of analysis, we shall refer to the classic Supreme Court decision, *Jungerson v. Ostby and Barton Co.*¹² The Supreme Court threw out a patent for an invention dealing with centrifuging wax into a mold for the purpose of intricately reproducing designs in jewelry and the like. It did this in the face of the fact that this invention had made possible novel results that had long been sought by the whole industry, that it was slavishly copied, once made known, and that it was the first technique ever to reproduce accurately and intricately this kind of jewelry. The Supreme Court held (p. 563):

Jungerson's process is nothing more than a refinement of a method known as "cere perdue" or "lost wax" process, which was in use as early as the sixteenth century. The treatises of Benvenuto Cellini
...

The prior art, the Supreme Court said, has been there for over 400 years; all one had to do was use it!

Let us draw the parallel, in Bell's situation, to Reis's work some fifteen years before Bell, and Bourseul's writings some seven years before that, which told the world that, if one caused the undulations of the air produced by sounds to produce corresponding variations in electric current, and employed telegraph-type apparatus therefore, the telephone would be born. Does this not correspond to Cellini's telling the world in the sixteenth century that one can use wax models for goldsmithing, and to what the Supreme Court, in the Jungerson case, termed the recognition, by those skilled in the art, of the necessity for making "molten materials fit snugly the intricate details of the mold"?

Jungerson's invention, the Supreme Court held, was merely "a refinement" of Cellini's method, including an application of centrifugal force thereto. Certainly Jungerson did not discover centrifugal force! Bell's invention similarly could have resulted as before explained, merely by "a refinement" of Reis's apparatus by proper adjustment of Reis's screw *h*. Screw adjustments were certainly recognized before Bell!

The Supreme Court made a point of the fact that "those skilled in the art recognized and disclosed the necessity for the application of force" – though

¹²335 U.S. 560.

not, of course, of Jungerson's particular successful centrifugal-force action in this technique, a fact which, however, the court found to be "of no legal significance" (p. 566).

That no one before had ever produced Jungerson's long-sought result, despite Cellini's age-old teaching and the recognition that a force was required, was of no significance to the court. Why, then, should the fact that no one had attained Bell's results, despite Bourseul's teaching, be of any more significance? Had not Bourseul himself "recognized and disclosed the necessity for the application of" electrical undulations that would correspond to the voice sounds?

The answer may lie in the dissent in the *Jungerson* case. Justice Frankfurter, adopting the words of dissent of Judge Learned Hand of the Court of Appeals below, pointed out (pp. 569-570).

My point is that, if there is a new combination, however trifling the physical change may be, nothing more is required than that, to take the step or steps, added "invention" is needed, and the "invention," whatever else it may be, is within the category of mental activities and of those alone. . . . Indeed it is the very basis of the defense that for years all the elements lay open and available, and that nothing was needed but the paltry modification which has proved so fruitful. . . . What better test of invention can one ask than the detection of that which others had all along had a strong incentive to discover, but had failed to see, though all the while it lay beneath their eyes?

But the time has long since passed when we can afford to engage in pretenses. The real philosophy, it seems to me, is involved in Justice Jackson's honest appraisal in his dissent (p. 572).

It is the strong passion in this Court for striking them [patents] down so that the only patent that is valid is one which this Court has not been able to get its hands on.

The reader is left to speculate whether Bell, before our present Supreme Court, would have had his patent sustained, whether, today, he would find backers who would invest in such a speculative, risky, and revolutionary business, knowing that ultimately it would probably receive this same kind of treatment at the hands of the court, and whether we could today build a private-industry American Bell Telephone system, with the remarkable advances and services it provides and which foreign government-owned telephone companies cannot begin to approach, let alone match.

CHAPTER 5

THE RIGHTS, OBLIGATIONS, AND PROBLEMS OF INVENTORS (EMPLOYEE-EMPLOYER RELATIONS)

Strongly threaded through the fabric of the invention-innovation cycle is the interplay between inventor and employer and between inventor and potential user or licensee. These relationships, including typical industrial, university, and governmental contract provisions, are herein set forth. Because the appropriation of inventions is a difficult matter to prove – though it happens every day – reference is made to one of the very rare proven instances, one that took several decades to resolve – the pioneer piezoelectric circuit inventions. This may aid in forewarning the inventor of the pitfalls in his path and in encouraging business and government to recognize rather than to circumvent or try to destroy the proprietary position of independent inventors.

In this era of conformity and considerable abdication of the right to negotiate employment terms and conditions, engineers and applied scientists appear to know little about their obligations to employers or to the firms who hire them as consultants, especially in the matter of inventions and patents. It may be in order, therefore, first to deal briefly with some general principles of law, and then to examine the policies of some of our leading institutions, industrial, educational, and governmental, as well as specific current contract provisions.

Whether an agreement between an employer and an employee relating to the disposition of patents and inventions is oral or in writing does not matter. Long ago, in England, a so-called Statute of Frauds¹ was enacted for the purpose of preventing litigation in cases almost impossible to resolve, involving certain kinds of oral contracts. The plaintiff would allege the terms of an oral agreement, and the defendant would deny those terms. There was no written evidence to prove the contentions of either side. How could the court resolve the dispute? The Statute of Frauds, therefore, made certain kinds of contracts unenforceable, unless in writing. American law has adopted this Statute of Frauds, but an

¹29 Chas. II.

oral agreement in which an employee undertakes to assign his invention to his employer is not included in the oral agreements that the courts will refuse to enforce under the Statute. They will enforce it if it can be proved to exist ².

While an actual assignment of a patent must conform to a specific statutory provision that requires a writing, the understanding between employer and employee as to who is to own the invention or patent may be oral. Now, how do you prove the oral agreement? One way is to examine the relation between and the conduct of the parties, which may cast light upon the rights of the several parties. The mere relation of employer and employee does not, of itself, mean that the employee is obligated to assign his invention to the employer.

As an illustration, if one is employed by a corporation as a sales engineer or as a secretary, and makes inventions extremely useful to the employer, including, even, improvements upon the employer's products, those inventions are the employee's property, in the absence of an understanding to the contrary. And it makes no difference what kind of employer is involved. The employer may be a corporation, an individual, a university, or the United States Government. The last situation was decided by the Supreme Court ³:

An employee, performing all the duties assigned to him in his department of service, may exercise his inventive faculties in any direction he chooses, with the assurance that whatever invention he may thus conceive and perfect is his individual property.

Why is this so? Perhaps the best answer is another illustration. Let us suppose that a man is employed as a mill carpenter. He receives his salary in return for performing duties as a carpenter. It so happens, however, that he is observant and thoughtful, and one day has an inspiration as to how to make a new type of floor rack, which could well be used even in his employer's business. Should this invention belong to the employer for either legal or moral reasons? Certainly the employer did not include inventing as one of the carpenter's duties, and he certainly had not paid the carpenter for using his inventive abilities. Now this is the test. Was the employee being paid for the purpose of making inventions? Were his duties merely those of carpenter or was he employed specifically to make inventions?

In just such a case the court held:

It is true that at the time he made and disclosed the invention to the defendant, ... [he] was one of its employees. His work, however, was that of mill carpenter. It had nothing whatever to do with floor racks or floor rack hinges. In no sense can it be said that his invention was made in the course of his employment ⁴.

If the understanding is that an employee is a sales engineer, a secretary, a director, and that he is employed to perform the customary duties of such

²*Dalzell v. Dueber Manf. Co.*, 149 U.S. 315, 320.

³*Solomons v. U.S.*, 137 U.S. 342.

⁴*Massie v. Fruit Growers Express Co.*, 31 F. 2d 463, 466.

employment, this is not an understanding that the employee is expected to invent. In the absence of further rights defined by contract between the parties, anything such an employee may invent is his own property, no matter how he was stimulated to make the invention. This is the general rule of law.

It has previously been pointed out that sometimes government officials in the United States think they should have special rights that others do not have. This kind of tactic has been rejected by prior Supreme Courts ⁵:

The government has no more power to appropriate a man's property invested in a patent than it has to take his property invested in real estate; nor does the mere fact that an inventor is at the time of his invention in the employ of the government transfer to it any title to, or interest in it.

This is important, because we shall see very shortly what the government shortsightedly demands today by way of special contract, both from direct employees and from people working under contract for the government.

Now, let us consider a slightly different situation. Let us suppose another case of an individual who is not employed for the purpose of inventing, but who does, nevertheless, make an invention. Assume, also, that he uses his employer's facilities and the services of other fellow employees to perfect this invention. Is it still the inventor's property? Yes – but this time the employer is contributing something to further the invention. Under such circumstances, a so-called “shop right” for the employer is created: the employer acquires a nonexclusive, royalty-free, irrevocable, personal license to use the invention himself. He cannot give this license to anyone else; it is personal with him, and he may use the invention royalty-free. The invention, however, still belongs to the employee.

Consider now a situation involving an employee of the United States Government. The employee is a naval officer, and his duties involve devising plans to protect the Philippines. If he finds a method and apparatus for adapting torpedoes to airplanes, the question arises whether his assigned duties implied making inventions such as this. If it does, the invention belongs to the government. At the very least, however, these facts

establish an irrevocable license in the government to the use of plaintiff's invention and patent ⁶.

In another case ⁷, an industrial chemist employed by the Public Health Service was relieved of his duties so that he might try to solve a particular problem at the Edgewood Arsenal; but he was still paid his regular salary. This is not the case of an invention made by an employee whose duties of employment do not contemplate conceiving and perfecting an invention. In such a case, the court reiterated, “the rule is that the invention is the property of the employee.” Nor is this a case where the only claim of the employer arises out of the fact

⁵See above, fn. 3.

⁶*Moffett v. Riske*, 51 F. 2d 868, 870.

⁷*Houghton v. U.S.*, 23 F. 2d 386.

that the employee used the property of his employer and the services of other employees to develop his invention, and has assented to the employer's use of the latter. Here, the court again reiterated, "the invention is the property of the employee, subject to an irrevocable license on the part of the employer to use it"; that is, a "shop right."

The case presented here is rather that of an employee who makes an invention while employed to conduct experiments for the purpose of making it. The court drew no distinction between work for the Public Health Service and that performed at the Edgewood Arsenal and paid for by the government. Thus, concluded the court,

he did merely that which he was being paid his salary to do. Under such circumstances, we think there can be no doubt that his invention is the property of his employer, the United States.

It is interesting to contrast this case with that involving two engineer employees of the Radio Section of the Bureau of Standards⁸. These men were assigned to various radio-research projects for the government. They conceived an idea in the very same radio field that was of use in commercial equipment, namely of constructing a power pack for operating from the mains to supply plate voltage for radio receivers without resort to B-batteries. They obtained patents for this invention and granted an exclusive license thereunder to the Dubilier Condenser Corporation, but reserving to the government a nonexclusive license, because of their use of government facilities for perfecting this invention. The government, believing that it was entitled to complete ownership of the patents, not just a nonexclusive free license, brought suit to obtain a court decree to such effect. As the court explained:

The United States is not content with such licenses and seeks in these three suits ... to obtain a decree compelling the defendant's right, title, and interest in the patents.

The test applied by the court was whether or not the inventions arose as a result of the employment of the engineers to solve certain problems for the government. The court concluded that their superior had given no specific instruction to engage in any research problem involving the inventions in controversy. That is the important point. While the engineers were instructed, as part of their employment, to engage in certain research projects and problems in the radio field, these had nothing to do with eliminating batteries in radios. The court found, accordingly, that

the most that can be said is that Lowell and Dunmore were permitted by Dr. Dellinger, after the inventions had been brought to his attention, to pursue their work in the laboratory and perfect the inventions which had theretofore been made by them.

⁸ *U.S. v. Dubilier Condenser Corp.*, 49 F. 2d 306.

The court refused to hold that all patents of research workers in the Radio Section of the Bureau of Standards belong to the United States, unless there was a special agreement. Only those patents dealing with inventions made within the specific scope of the employment would become government property.

5.1 University and Government Relations

In the light of these principles of law, it is in order to examine the manner in which various educational and business entities contract with their employees. Consider first Harvard University. Harvard has adopted the attitude, fully consistent with the general law, that a student or a professor is not employed nor given facilities for the purpose of inventing, and so any inventions that he may make become his own property, which he may do with as he desires. There is, however, one exception adopted under President Lowell's time under the impetus of a certain unpleasantness in connection with the respirator invention of Dr. Philip Drinker. No member of the university may now take out a patent that is concerned primarily with the field of public health or therapeutics without the consent of the President and Fellow of Harvard College (the legal name of the governing body of the university). While embarrassment may be created in other fields, apparently nothing is quite so touchy, from the public relations angle, as public health.

In connection with government contracts, however, Harvard's policy is considerably modified. The United States Government requires in its contracts with Harvard that the latter assume certain obligations, among them that its staff and other people working at Harvard under government contracts shall grant the government certain rights. The general Harvard-employee agreement, in connection with work under a government contract, commences as follows:

In order to enable Harvard University to fulfill its obligation under Contract between the President and Fellows of Harvard College and the United States Government and as a condition of my employment.
...

Then comes a term used over and over again in government contracts – “subject invention.” Most government departments require that if, during the performance of a contract, an employee under the contract conceives an invention for the first time, or first actually reduces it to practice by constructing and operating it successfully under the contract, the government shall have a free right to practice that invention and to have the invention made for it by other people. Hence, in this employee agreement, a so-called “subject invention” is defined in the following terms:

Any invention, improvement, or discovery (whether or not patentable) conceived or first actually reduced to practice by me ... either (A) in the performance of work called for or required under said contract, or (B) in the performance of ... work ... which was done upon an understanding in writing that a contract would be awarded.

In connection with such invention, the employee agrees and thereby grants

to the United States Government irrevocable, nonexclusive, non-transferable and royalty-free license to practice, and cause to be practiced by or for the Government throughout the world, each "Subject Invention."

The employee also agrees to disclose the invention promptly to his contracting officer. Under this particular contract, the employee has an option⁹ either to file the patent application himself or to give the government the opportunity to do so. The employee may thus have the commercial nongovernmental rights to his invention if he exercises the first option.

It will be recalled that certain bars to obtaining a patent reside in the publication of the invention, or public use or sale in this country of the invention, more than a year before the application is filed. Under this government contract, therefore, the employee agrees to notify the project director, not later than eight months after any such publication, public use, or sale of his invention, that he does not intend to file an application. The government will then have four months in which to file an application, if so minded. Furthermore the government demands the right to reproduce copyrightable material, data, plans, specifications, without any interference whatsoever; and such rights are granted together with the patent licenses under these contracts. A similar agreement is executed by the project director himself, the terms of the employee agreement being directly incorporated by reference into his own.

Now let us turn to the Massachusetts Institute of Technology. The Institute has a little different philosophy. It concurs with Harvard only to the extent that inventions or developments made by the staff members, and not related to any Institute program of research with which the members may be concerned and to which the Institute does not contribute any funds,

shall be the exclusive property of the individual producing the invention or development. The Institute will not construe the payment of salary or the provision of normal academic environment as constituting grounds for equity by the Institute in such invention.

Formerly, if a staff member or student made an invention in which the Institute had an equity, patent applications were usually filed through the Research Corporation of New York City, a nonprofit organization that endeavors to promote inventions in order to obtain funds for further research. Net income from the inventions, after expenses, was divided equally between the Research Corporation and the Institute, the latter employing such receipts to further its own educational and research policies. The inventor normally received 12 per cent of the gross royalties that the Research Corporation negotiated under the invention.

At present, arrangements with the Research Corporation have been terminated, and it remains to be seen what new policies will be adopted. The actual

⁹Army, Navy, and Air Force contracts.

paucity of patents stemming from the millions of dollars spent in research at M.I.T. should cause consideration over the kind of policy that will stimulate the staff to carry new discoveries and techniques to the patentable invention stage. As at Harvard, the Institute staff must execute the previously discussed invention and copyright agreements, in connection with government contracts.

A little different situation arises in connection with contracts with the Atomic Energy Commission. It will be recalled that the law prohibits the granting of patents in the field of atomic energy when those patents relate primarily to the production of fissionable material, processes, or instrumentalities used in the production of such material, or in weapons themselves. Consequently, the AEC takes a somewhat stronger position and declines to let the inventor himself file for a patent. Instead, it claims the right to decide who shall own the invention. Under an AEC patent clause, therefore, the following provision is set forth:

Whenever any such invention or discovery results from such work paid for in whole or in part from Commission funds ... the Commission shall have the sole power to determine whether or not and where a patent application shall be filed.

Even if the contractor spends his own money under an AEC contract to make an invention, the AEC demands certain rights. Under those circumstances, the Commission

shall retain at least a nonexclusive, irrevocable, royalty-free license under said invention, discovery, application for patent.

Under the National Aeronautics and Space Act of 1958, the administrator, through appropriate determinations and unless he waives the government's rights, is empowered to claim for the United States the *exclusive right* to invention under this program. If these restrictions remain, only history can record whether American industry and the American inventor will be actually stimulated and challenged by these provisions, or by the system of monetary awards for significant scientific or technical contributions to aeronautical and space activities, that Section 306 of the Act empowers the administrator to grant. Recent congressional hearings have not, in my view, resulted in any real change of attitude.

5.2 Summary of Current Governmental Agency Regulations Concerning Patents

The Department of Defense, as provided by Section IX of the Armed Services Procurement Regulations, acquires a royalty-free, nonexclusive license to make and have any inventions arising under its research and development contracts, and acquires no license or other patent rights on contracts involving the delivery of supplies or products. Similar policies govern contracts of the Veterans' Administration, the Post Office Department (which agrees not to use its license to compete with the contractor or its commercial licensees), and the General Services Administration. Under the Research and Marketing Act, the Department

of Agriculture requires that inventions resulting from its research and development contracts be either dedicated to the public or assigned to the government for the issuance of royalty-free, nonexclusive licenses to qualified parties.

The Department of Health, Education and Welfare reserves the right of the government to determine the ownership and the disposition of inventions flowing from its research and development contracts. In the case of industrial research contracts in the field of cancer chemotherapy, on the other hand, the right to patent may be left with the contractor, but with that right vested in the Surgeon General to protect the public interest, as, for example, by assuring royalty-free, nonexclusive licenses to own the public. Nonprofit institutional contractors may also own patents on inventions arising under a research and development contract, subject to stipulations necessary to protect the public interest.

While the Department of the Interior has a present policy of attempting to have patents assigned to the government, it will, in the case of recalcitrant contractors, accept a royalty free, irrevocable, nonexclusive license. The Department of Commerce also follows a flexible course as to whether the government is to own patents or obtain a royalty-free nonexclusive license. In the case of Maritime Administration research and development contracts, the same provision is applied to marine research, but the patent provisions of the Atomic Energy Act of 1946, as amended, are employed where nuclear material or atomic energy is involved. That Act, under which the Atomic Energy Commission also operates, requires the retention by the government of the sole power to determine and dispose of patent rights.

The National Aeronautics and Space Act of 1958, previously alluded to, was modeled after the Atomic Energy Act of 1946, as amended, and requires even more broadly that the Administration itself shall be deemed to have made or conceived any invention or discovery “made or conceived under any contract, subcontract, arrangement, or other relationship with the Administrator, regardless of whether the contract or arrangement involved the expenditure of funds by the Administrator.”

Merely discussing an idea with the Administrator would, if this Space Act provision is literally interpreted, be a “relationship” or “arrangement” that would vest all rights in the government. It is small wonder that many representatives of American industry, science, and law have protested this wording of the statute¹⁰, and that proposed revisions are under consideration. Indeed, the principal finding of a recent thorough two-year study by the Denver Research Institute is that only negligible commercial inventions have spun off from the multi-million-dollar NASA research programs: about six patent applications filed each year of the life of NASA for developments from NASA-funded contracts. How long does government have to wait to learn that few companies with real competence and backbone will produce under this kind of so-called stimulus?

¹⁰ “Property Rights and Inventions made under Federal Space Research Contracts,” Hearings before the House Subcommittee on Patents and Scientific Inventions of the Committee on Science and Astronautics, 85th Congress, 1st Session (1959).

An analogy to Soviet philosophy is striking evident, as discussed in a Congressional report on proposed revisions ¹¹:

Contrasts were drawn between the American patent system and its operation, on the one hand, and the Soviet patent system and its method of operation, on the other. The argument goes about as follows: Whereas the American patent system depends upon free and open competition for commercial markets, the Soviet system depends upon a determination by the Government as to the economic or commercial necessity of producing an article as a basis for its industrial operation. There is some similarity between the so-called patents of the Soviet system and the wording of sections 305 and 306 of the National Aeronautics and Space Act of 1958 (which are substantially the same as patent and compensation or award provisions of the Atomic Energy Act). The Government ownership provisions of the NASA and AEC statutes, if carried out literally, would correspond to the "public patents" provision of the Soviet system in that there can be no private commercialization of the inventions with Government approval. The "compensation or award" provisions of the NASA and AEC statutes correspond to the "private patent" provisions of the Russian system in that the inventor will not be rewarded unless the Government allows commercialization or use of the invention in the interest of the public.

5.3 Industrial Employment Agreements

Let us now turn to industrial organizations. Two typical illustrations of employer-employee contracts are provided by the General Electric Company and the Radio Corporation of America. The General Electric Company does not treat inventing engineers as a class separate from other employees. It provides a sweeping provision "in consideration of my employment *in any capacity*" If one wants the position, therefore, he agrees that "all inventions made or conceived by me . . . from the time of entering the Company's employ until I leave" will be the sole and exclusive property of General Electric. There is a qualification, however. Only two fields of invention are so included, namely inventions which are along the "lines of business, work or investigations of the Company . . . or which result from or are suggested by any work which I may do for or on behalf of the Company." The employee then agrees to assist GE in obtaining the patent and to keep adequate written records of the invention, the records to remain the property of the company.

Another important clause covers matters with which a company, as distinguished from a university, is vitally concerned. Some things, as I have previously noted, are not susceptible of patent protection, or there is no purpose in patenting them. Know-how and trade secrets are in this category. The general rule

¹¹ "Proposed Revisions to the Patent Section, National Aeronautics and Space Act of 1958," march 8, 1960 (Mimeo).

is that a confidential relationship exists between employer and employee, and that the employee is not free to disclose trade secrets, even after leaving the employer.

In an interesting recent case, for example, the makers of Rise instant shaving cream, the Carter Company, sued the Colgate Company for patent infringement and for unfair competition in hiring one of the key employees (the inventor) away from the Carter Company and using the trade secrets that the employee had acquired¹². The court not only sustained the patent, but also awarded attorney's fees and costs because of the wanton character of Colgate's action in hiring away an employee and using trade secrets that he had obtained in his prior employment.

In order to have this protection in writing, and not be compelled to rely on the general rule alone, however, the General Electric Company employment agreement states that, as a condition of employment, the employee agrees "not to disclose at any time either during or subsequent to my employment, any information, knowledge or data of the Company . . . relating to formulas, business processes, methods, machines, manufactures, compositions, inventions, discoveries or otherwise, which is of a secret or confidential nature¹³."

In the second example, the corresponding employment agreement of the Radio Corporation of America does not apply to all employees. The patent agreement is restricted to employment in a capacity where the employee is "reasonably expected to make new contributions and inventions." So if one is employed as a janitor or a secretary at RCA, he still has the common-law right to inventions, even if stimulated by what he has seen in the RCA laboratory. The employee who is expected to invent agrees to assign all inventions, made during employment, that relate to the business or interests of the company, or that result from tasks assigned by the company. In order to safeguard its obligations under government contracts, however, RCA requires that even if it employs a person in an occupation where he is not expected to invent, and where there is normally no obligation to assign inventions, RCA obtains rights under two exceptions; if the employment is under a government contract, and if the work is intended to lead to the granting of a government contract. The RCA agreement, like that of other companies, excludes all inventions made prior to employment with the company.

A few words now about the way in which the employer compensates the inventor for his inventions. Recently a very liberal policy was reported to have been adopted by a relatively small company¹⁴, that not only pays a token sum of \$25 when patent application is filed and another \$50 when the patent is granted, but also agrees to pay to the employee, as a stimulus to invention, royalties starting with 10 per cent of the net cash royalties that may come from licensing others. Most companies, of course, have no such policy. GE pays a bonus of \$100, partly in cash and partly in company stock, upon the filing of the

¹²*Carter v. Colgate Palmolive Company*, 230 F. 2d 855.

¹³The terms "confidential" and "secret" are used in the ordinary sense and not in the government security sense.

¹⁴*Electronic Manufacturing* (a monthly newssheet), Oct., 1957, p. 115.

application. RCA also pays \$100 upon the filing of the application. This is based upon the belief that it is frequently impossible to determine what important contributions may have been made to the development by employees other than those whom the law identifies as “inventors.” To attempt to approximate an evaluation for “inventions” only and to make individual payments based on such evaluations to “inventors” could, it is stated, result in inequities and could hamper team play, a result which, in turn, would slow down progress. Instead, reward comes at GE by promotion in position and salary.

Another interesting topic is the situation when engineers and applied scientists approach outside companies, asking them to consider ideas and inventions with a possible view to negotiating a license agreement. Two illustrations will suffice to show the reason for the present attitude of the large companies.

An individual suggested an advertising idea to the manufacturer of Chesterfield cigarettes, indicating that he expected reasonable compensation if the company used it. The company never replied, but several years later its advertising agency, which purportedly had never seen the submitter’s idea, hit upon a very similar proposal. The company adopted this proposal and was thereupon sued by the original submitter for misappropriation of his idea. A sizable jury verdict for the plaintiff was sustained by the Supreme Court of Indiana.

The second case is that of a manufacturer of three-way light bulbs. In order to avoid adverse publicity, and because it was difficult to prove independent conception, it settled a suit out of court for a reported \$150,000 with a stranger to it, but who had some years earlier voluntarily sent it a similar idea.

In order to protect themselves, therefore, many companies will absolutely refuse to receive any disclosures from outsiders, unless the disclosure is covered by a filed patent application, or unless the submitter agrees that there is no confidential relation involved in the disclosure and that he will rely upon his patent rights alone. Only under these conditions will these companies receive for examination an outsider’s invention.

5.4 The Problems and Dangers in Negotiation – One of the Rare Proven Cases

The dangers inherent in making such disclosure need examination, however, as well as the shameful record of certain large companies in dealing improperly with eminent men of science and of the engineering profession, in order that the risks involved may be understood.

Professor Frederick V. Hunt describes some of these risks in resume form¹⁵. His account, which constitutes an important part of the history of radio, will now be supplemented by additional information relating to past experiences in connection with inventions submitted to the Western Electric Company and to the International Telephone and Telegraph Company. These are among the very, very few instances where such conduct was actually exposed; and even here it took several decades to prove.

We shall begin with the piezoelectric crystal and circuit inventions of Professor Walter G. Cady, formerly of Wesleyan University. Dr. Cady’s name is

¹⁵Frederick V. Hunt, *Electroacoustics*, pp. 23 - 25.

extremely well known in the electronics field as one of the pioneers in stabilizing electric oscillations with the aid of quartz crystals. During World War I, he was one of a number of American scientists engaged in trying to solve the submarine problem. He heard about the work of Professor Paul Langevin, in France, who had found that he could employ Curie's discovery of piezoelectricity for submarine detection: if sound energy from a submarine strikes a quartz plate, the piezoelectric effect will produce a small voltage that can be detected. Conversely, if an alternating voltage is applied to the crystal, the crystal will be forced to vibrate and to transmit sound into the water. This was the kind of apparatus with which Cady and a number of others were concerned at New London.

After the war, Cady continued his investigations with these quartz devices and made several inventions which were lumped together into two patents¹⁶. When it was appreciated that more than one invention actually was involved in each of these patents, applications for so-called "reissue patents" were filed.

A reissue patent may be granted under the following circumstances. If one has, through inadvertence, made a mistake in his patent, or has failed to appreciate or understand the true scope of the invention, he may in certain instances refile that patent. This does not result in extending the patent "monopoly" since the reissue patent dates from the issue of the original patent, but at least the patentee will have an accurate patent.

This is what happened to Cady, so that his original patents were released as a group of reissue patents¹⁷. Included in these inventions were what have become known as the crystal stabilizer and the crystal-controlled oscillator. Figure 6 shows in Fig. 3 of the patent drawing an electron tube 4 having an input tuned circuit comprising coil 7 and condenser 9 and an output circuit having a coil 8 coupled to the coil 7 to form an "Armstrong oscillator," the frequency of which is controlled primarily by the values of the coils and the condenser. Cady discovered that if a piece of quartz were connected into this circuit at 12, then, in a very narrow range of adjustment of this oscillating circuit, a phenomenon took place in the circuit (region 4 in Figs. 5 and 6 of the patent drawing) where the crystal seemed to lock the frequency. If the condenser 9 was adjusted a bit further, the crystal lost control, so that the crystal could stabilize the oscillator only over a very limited range. That is the stabilizer invention.

Cady also found that if he employed a long bar of quartz, as shown at 12 in Fig. 2, connecting one end of the quartz to the input 1-4 of the first tube of a train of amplifiers and the other end of the quartz to the output 5 of the last amplifier, the quartz bar 12 would itself mechanically couple energy between output and input, and sustain oscillations without the use of coils and condensers, and at a frequency controlled and determined by the dimensions of the

¹⁶U.S. Patents Nos. 1,450,246 (April 3, 1923) and 1,472,583 (Oct. 30, 1923).

¹⁷Reissue Patents Nos. 17,245 (four-electrode crystal stabilizer); 17,246 (four-electrode crystal oscillator); 17,247 (crystal stabilizer for "Armstrong" oscillator); 17,355 (piezoelectric crystal resonator); 17,356 (piezoelectric crystal wavemeter); 17,357 (crystal resonator coupled to another medium); 17,358 (filter embodying piezoelectric crystal); and 17,358 (crystal resonator coupling two circuits).

bar of quartz. In view of the inherent necessary size of the four-electrode crystal bar, the frequency of oscillations was not very high. This was, nonetheless, the first crystal-controlled oscillator.

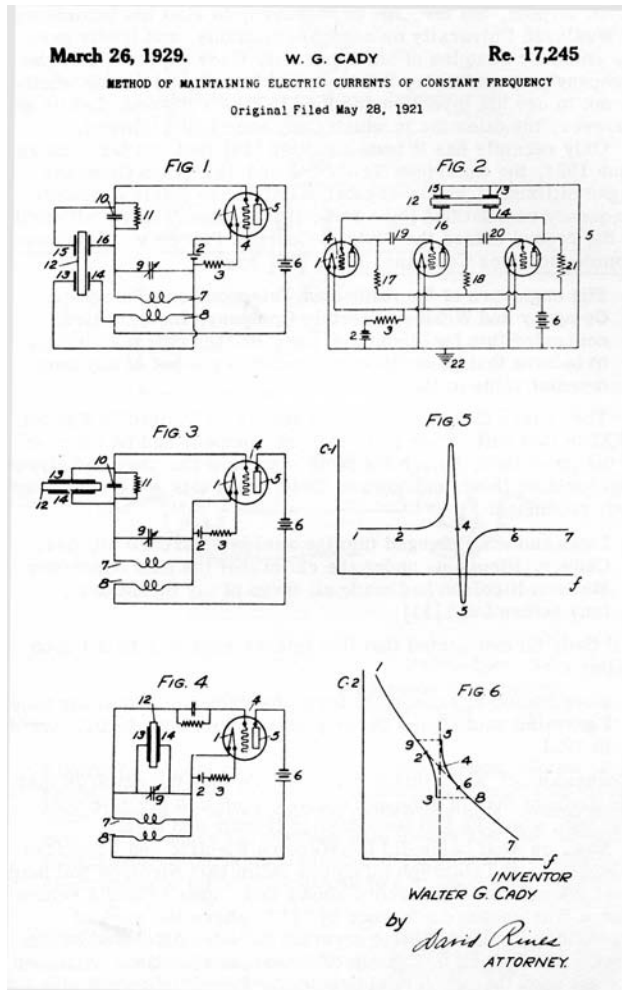


Fig. 5.1: Cady's patent drawing. (This image is public domain and is not protected by copyright.)

And so, very excited about these developments, Cady went to the logical corporate giants in the field of communications and solicited the interest of the American Telephone and Telegraph Company and the Western Electric Company, Inc., in his inventions. He freely disclosed all of his patent application, permitted the company engineers, including his former student, H. D. Arnold, the director of research, to visit his laboratory at Wesleyan University on several occasions, and freely gave the company samples of his apparatus. Cady expected that the company was evaluating this material in order to decide whether or not to use his invention and thus to take a license. Let us see, however, the dilemma in which Cady soon found himself.

Only recently has it been admitted ¹⁸ that, as far back as June 1924, the American Telephone and Telegraph Company began utilizing a quartz-crystal oscillator to obtain constant-frequency oscillations for a radio transmitter. Cady's affidavit in the record before the District Court in *Pierce v. American Communications Company, Inc.* ¹⁹ says:

The engineers of the American Telephone and Telegraph Company and Western Electric Company, Incorporated, concealed this fact from me, and, on the contrary, led me to believe that piezoelectric crystals were not of any commercial value to them.

The letters Cady has received appear as Plaintiff's Exhibit CXXI in this suit. They state that the company had no interest in the inventions, though the facts now show that they had already appropriated them, unknown to Cady. As if this were not enough, Cady continues:

I was suddenly plunged into the said Interference 50, 545, Cady v. Nicolson, under the claim that the said Alexander McLean Nicolson had made all three of my inventions . . . long before I did ²⁰.

And Cady further stated that this interference was based upon claims that

were copied in exactly the form that they were in at the time I gave said copies of my patent applications to Dr. Arnold, in 1921.

"Concealment" and "interference" were thus the rewards that this eminent man of science received from this gigantic company with which he had been dealing frankly and freely.

Now, on what basis did the Western Electric and American Telephone and Telegraph attorneys claim that Nicolson had made these inventions? The record shows that, upon Arnold's return from a Washington conference in 1917, where the work of Langevin with piezoelectric crystals had been disclosed by the French and British to a group of American scientists, Nicolson was set upon the problem of developing Langevin's work. He did make some original contributions with

¹⁸Raymond A. Heising, *Quartz Crystals for Electrical Circuits*, Van Nostrand, 1946.

¹⁹111 F. Supp. 181.

²⁰Nicolson was an engineer in the employ of Western Electric Company, Inc.

Rochelle salt crystals as Hunt's account explained ²¹. Figure 7 shows part of Nicolson's original patent, the application for which was filed April 10, 1918.

²¹Frederick V. Hunt, *Electroacoustics*. p. 52.

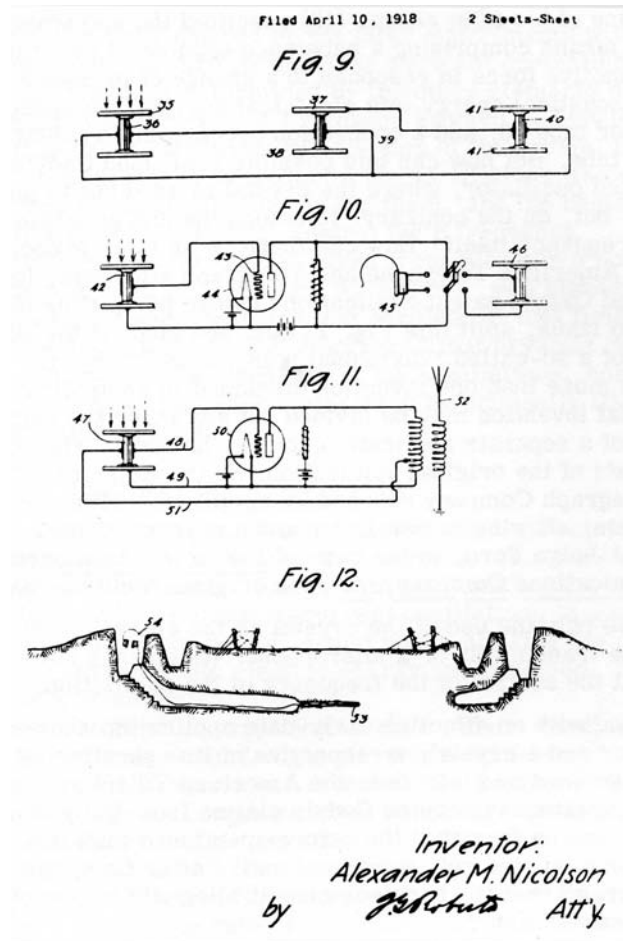


Fig. 5.2: A part of Nicolson's original patent. Claim 12 reads, "Means for translating acoustical energy into electrical energy, a space current device having a control member, and a connection between said means and said device, said means comprising a substance capable of generating electromotive force in response to a change in pressure." (This image is public domain and is not protected by copyright.)

In Fig. 12 of the patent, a Rochelle salt crystal 53 is placed in a tunnel near the enemy trench. The crystal is connected to a pair of earphones 54 so that the enemy movements can be detected. As one modification, the crystal may modulate an alleged electric oscillator (Fig. 11 of the patent), and an antenna may transmit the oscillation signals to a remote receiver, instead of using wires between the Rochelle salt crystal picking up vibrations and the earphones. That was Nicolson's original case. One of his first claims (12) specified the combination of crystal means comprising a substance capable of generating electromotive force in response to a change of pressure for translating acoustical energy into electrical energy, the space-current oscillator tube 50, and a connection between the translating means and the tube. But how can this possibly bear upon Cady's crystal-controlled oscillator, where the crystal is used not to pick up sounds, but, on the contrary, to determine and generate the oscillation frequency itself? How can there be an interference?

The American Telephone and Telegraph attorneys, having inspected Cady's patent applications before permitting the Nicolson patent to issue, split this Fig. 11 out, and made it the subject matter of a so-called "divisional applications." That is, where there is more than one invention disclosed in an application, the additional invention may be divided out and made the subject matter of a separate application, being, however, entitled to the filing date of the original application. So the American Telephone and Telegraph Company now had an application with an early 1918 filing date, showing an oscillator and a crystal, though, in the words of Judge Ford, in the case of *Pierce v. American Communications Company, Inc.*, the original Nicolson disclosure

shows only the use of the crystal as the equivalent of a telephone transmitter or a microphone. He teaches nothing about the control of the frequency of the oscillations.

Armed with an effective early-date application showing an oscillator and a crystal, irrespective of its operation as originally described and intended, the American Telephone and Telegraph attorneys copied Cady's claims from his patent applications, and so provoked the before-mentioned interference. As Judge Ford pointed out, it was not until "after Cady had made his disclosures" that the Nicolson circuit allegedly became a crystal-controlled oscillator.

So Professor Cady found himself enmeshed in a legal contest with the giant American Telephone and Telegraph. He thereupon sold out to the Radio Corporation of America. Hunt explains how, through improper handling, the claims that belonged to Professor Cady were later awarded to Nicolson. Thus, one finds in the Nicolson patent the claims for Cady's invention, namely a device where the circuit is stably nonoscillatory when not under the control of the crystal vibrator, and where the frequency of oscillations, when the system oscillates, is stably determined by the frequency of vibration of the vibrator.

The significance of that improper handling is evident from Judge Ford's later determination in *Pierce v. American Communications Company, Inc.*

Indeed it appears that although Nicolson may have believed he had

a crystal-controlled oscillator, in fact he did not. Professor Cady showed by his later experiments with the Nicolson circuit that oscillations were not controlled by the crystal but were determined by the other elements of the circuit. The evidence of Professor Edward L. Bowles' affidavit is to the effect that the function of the crystal in the Nicolson circuit is to modulate the oscillations (the only function he originally claims for them, and the basis for his earlier patent) and not to control their frequency.

Defendant has introduced pages from Nicolson's note book written in 1918 . . . Dr. F. W. Kranz, who signed these pages as witness, testified that Nicolson at that time said nothing to indicate he had discovered that crystals could be used to control the frequency of the oscillations, nor did Nicolson make any such claim when he originally filed his application in 1918.

5.5 Professor Cady Was Not Alone

The A T & T, however, was not partial only to Professor Cady. Take the application of Professor Langevin, who was thousands of miles away in France. Langevin's application showed a quartz crystal driven by alternating-current oscillations in a coil to generate sounds. Conversely, sound waves striking the crystal would be converted into electric energy and received. This was Langevin's invention.

So into the Nicolson application went a claim reading, "An oscillating circuit comprising a piezoelectric device." This is, of course, what Langevin had invented. An interference was declared. Langevin complained that French representatives, Majors M. Fabry and H. Abraham, had disclosed his invention to a whole group of scientists, including Dr. Arnold and others of the Western Electric Company, as before mentioned, before Nicolson's 1918 filing date. But again A T & T prevailed. Nicolson was awarded priority, because Langevin's long-distance stipulated proofs were not technically sufficient. Thus, the Court of Customs and Patent Appeals ²² ruled:

The record in the case so far as the testimony on behalf of both parties is concerned is very informal and very unsatisfactory . . . deficiency occasioned by an inferior record.

The court was forced to reject as unproved the facts of the actual disclosure at the 1917 Washington meetings (as testified to by Professor Cady in *Pierce v. American Communications Company, Inc.*). In the court's words, quoting the Board of Appeals,

Whether or not Langevin had the invention or had imparted knowledge of it to Fabry or Abraham, the fact remains that no documentary evidence has been produced showing what was disclosed at the Washington meeting.

²²110 F. 2d 687, 690.

It is extremely significant that the A T & T and Western Electric attorneys did not use Dr. Frederick W. Kranz, formerly of their employ, as a witness in this interference. Dr. Kranz's statement in *Pierce v. American Communications Company, Inc.*, is most revealing:

In 1918, Nicolson and I occupied adjoining desks. . . . I recall a conference at the laboratory about 1917 in the course of which Dr. Crandall informed us of the work of Professor Paul Langevin, of France, involving the use of piezoelectric crystals as sound transmitters and receivers. . . .

Having been successful in appropriating the inventions of Professors Cady and Langevin, why should not A T & T attempt to appropriate the commercially practical and most important crystal-controlled oscillator inventions of the late Professor George Washington Pierce, former Rumford Professor of Physics and Gordon McKay Professor of Applied Physics at Harvard? The Pierce oscillator is of two principal types (Figure 8): first, as shown in Fig. 2 of the patent, an appropriate two-electrode crystal 2 connected between the grid 26 and the anode or plate 30 of the electron tube 24; and, secondly (Fig. 11 of the patent), the two electrode crystal 2 connected between the grid 28 and the filament or cathode 26.

But Nicolson's mammoth Rochelle salt crystal for responding to sound waves has at least three electrical connections and one can trace some kind of connection to each of the tube electrodes. Why, therefore, should not Pierce's invention, too, be claimed by Western Electric on the basis of the Nicolson application and by A T & T on the basis of an application of an A T & T engineer, Bailery? So A T & T copied Pierce's claims and provoked interferences. This time, however, it came up against an applied scientist who was prepared to fight in defense of his rights.

There were years of litigation which finally culminated in victory for Pierce²³. When it appeared that Bailey was beaten, Western Electric urged Nicolson as the prior inventor. Pierce's attorney took the position that A T & T and Western Electric were really the same company, the former owning more than 98 per cent of the stock of the latter. He set out to prove that they had the same management control and were, in effect, the same entity. Therefore, since Pierce had beaten Bailey (A T & T), he was not compelled to have another suit against Western Electric on the Nicolson application. The contention was that the matter was *res judicate* – decided, once and for all. Not long after, an A T & T attorney, George E. Folk, visited Cambridge, thrust out his hand, and said to Professor Pierce, "Call me George."

When the basic Pierce oscillator patent issued, Professor Pierce carefully claimed therein only what represented his advance over Cady and he would take no claim broad enough to dominate Cady, though I am informed that as a result of the settlement with A T & T he could have had any of the oscillator claims that later issued in the Nicolson patent.

²³Interference 67, 863, *Pierce v. Bailey v. Nicolson*.

The Western Electric Company Nicolson patent then issued, with Langevin's claims and Cady's claims, and, for years A T & T used this patent as a club to collect royalties on every crystal-controlled oscillator – collect, that is, except from those who knew the real meaning of the Nicolson patent.

Let me give an illustration. Claim 1 of the Nicolson patent that was taken from Professor Langevin, reads: “An oscillating circuit comprising a piezoelectric device.” This claim, in its true history, refers to Langevin's idea of having an oscillating circuit drive a crystal. It has nothing to do with a crystal controlling the oscillations itself. And yet, in their licensing policy, the A T & T has read this, or tried to read this, on crystal-controlled oscillators. This is what is known as “verbal infringement.” The words of the claim sound as if one were infringing, but the meaning of the claim, as shown by the file history, is not the same thing. There is, therefore, no infringement. I stress this point because very often one cannot tell, merely by reading the claims of a patent, what they actually cover.

In rewriting history a few years ago, through the eyes of the Telephone Company²⁴, an effort was made to try to evolve the Pierce oscillator from Nicolson's maze of crystal-modulator connections. In *Pierce v. American Communications Company, Inc.*, however, Professor Edward L. Bowles discussed

the circuit diagrams of page 15 of the Heising text which are labeled “Nicolson's oscillator circuit.” In the interest of accuracy, I point out that the alleged Nicolson circuit and its variations shown on page 15 do not either accord or agree with the Nicolson circuit of patents 1,495,429, filed April 10, 1918; and the alleged divisional patent directed to Fig. 11, 2,212,845, filed April 23, 1923. This is clear from a mere cursory inspection.

Professor Bowles explained the details of this and, as stated by Judge Ford, showed

that although Nicolson may have believed he had a crystal-controlled oscillator, in fact he did not.

Judge Ford found, moreover, that

Nicolson still shows the same whole Rochelle salt crystal of his earlier patent, with three electrodes arranged so as to operate as two pairs of electrodes. . . . The Pierce oscillator is so designed as to oscillate only at the frequency determined by the crystal, the presence of which is necessary if the system is to oscillate at all. Nicolson, on the other hand, while claiming that his system may oscillate at a frequency determined by the natural frequency of the crystal and under the control of the crystal, is also careful to point out that by proper use of reactances it may also be made to oscillate at some

²⁴See above, fn. 19.

other frequency than that determined by the crystal. Clearly, this does not purport to be the same thing as the Pierce oscillator.

...Defendant ... argues that in 1918 Nicolson had already hit upon the circuit which Pierce later patented. But these only show that in 1918 he was working on circuits which may superficially resemble that of Pierce, as do those, for instance, of his earlier patent, which, however, discloses only a different function and mode of operation of the crystal. ... These pages furnish no warrant for a conclusion that Nicolson in 1918 had anticipated what Pierce was later to discover.

I should now like to recount, apropos of the plight of scientists when bringing inventions to our corporate manufacturers, the latest pronouncement relating to such activity, this time in connection with the International Telephone and Telegraph Company. And the same Professor Pierce was involved. The decision is reported in *Pierce v. International Telephone and Telegraph Corporation*²⁵. Judge Hartshorne of the District Court for the District of New Jersey found that

Following Pierce's patent applications in the 1920's or early 1930's, Pierce at *I T & T's request*, not only opened up his secret papers to I T & T for their examination anent the possibility of its taking out a license thereunder, but he also permitted I T & T's representatives to visit his laboratory. In the complaint and at the trial the question was raised as to whether Pierce's disclosures were confidential and whether such confidence had been breached by I T & T.

The court went on to tell the kind of tactics that I T & T promoted:

I T & T doubtless used every possible means to secrete its circuit diagrams from Pierce, who had so freely showed I T & T all he knew about his invention.

And again:

Here we must bear in mind that, as seen above, I T & T had acted in a peculiarly secretive manner, particularly with respect to the man who, in previous years, had given it every assistance, in the form of access to secret documents and in personal visitations and conferences at his laboratory.

5.6 Conclusion

The dilemma facing the inventor who discloses inventions to outside organizations is thus pointed up by the typical (but rarely proved) specific experiences just recounted. The law, as presently applied, is inadequate; and something must be done more properly to protect the rights of inventors.

²⁵147 F. Supp. 934.

In the next chapter, I shall discuss some of the proposals before Congress for improving the patent system and the enforcement of patents by the courts. If an effective program can be activated, our corporate giants may be more wary about appropriating the inventions of others and wearing the inventors down by costly and vexatious litigation.

Judge Wyzanski, of the Massachusetts Federal District Court, in connection with Professor Rudenberg's electron-microscope patent ²⁶, deplored the condition of "the individual holder of patents" who is

at the mercy of large corporate enterprises which could use the invention, decline to accept the inventor's reasonable offers, allow him to sue for infringement and in the end, if beaten in the infringement suit, pay him not even a royalty high enough to cover the expenses of the litigation.

To similar effect are the words of Judge Hayes of the District Court for the Middle District of North Carolina ²⁷:

The result is not encouraging to an inventor. Indeed a patent, however valid and however flagrantly infringed, would be worthless in the hands of a person with small means if it had to survive the obstacles which have confronted the patent in suit. This is battle by the defense to ignore the patents until a court of last resort compels a course otherwise.

So the time has come for frank talk. If Congress, in these precarious times, is anxious to encourage inventors (and I have tried to show herein that many of the important advances have come and still do come from individual inventors entirely outside established research laboratories and organizations), then Congress must make the inventor more secure at the hands of the potential infringers and in the courts.

²⁶ *Rudenberg v. Clark*, 81 F. Supp. 42, 45.

²⁷ *Davis Co. v. Baker-Cammack Hosiery Mills, Inc.*, 86 F. Supp. 180, 187.

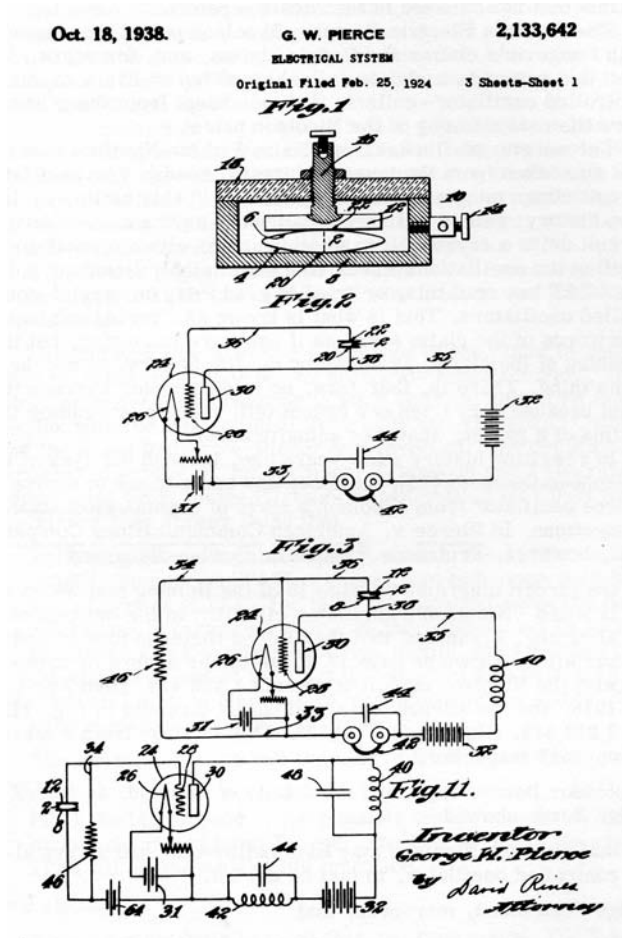


Fig. 5.3: A part of Pierce's patent. (This image is public domain and is not protected by copyright.)

CHAPTER 6

THE FUTURE OF AMERICAN PATENTS

Recent proposals for improving the patent system are discussed, including conflicting philosophies in Congress and in the courts.

A number of proposals have been made to Congress for consideration as bases for possible future legislation which may improve the patent system and its operation. They may also undo what the courts and other governmental agencies have done to dishearten and discourage both inventors and persons with venture capital, from taking a bolder approach in exploiting and developing new fields, unless under government direction or some other inherently restricting and often unimaginative sponsorship.

6.1 Previous Suggested Improvements in the Patent System

Among the scientists who have been active in the field of patents is Vannevar Bush, wartime director of the Office of Scientific Research and Development. Dr. Bush, a number of other scientists, and lawyers have the initiative in trying to recover and increase, in this country, fertile ground for invention and a more rapid progress in the development of the useful arts. To this end, an analysis and series of proposals has been provided in a study for the Subcommittee on Patents of the Senate Committee on the Judiciary¹.

Unfortunately, as will later be evident, I do not agree that the underlying problems can be solved by the principal proposals that have been advanced; but the proponents are to be commended for their initiative, purpose, and sincere effort. As part of constructive criticism, moreover, substitute proposals will be offered, which I believe can effectively reverse the present unhealthy trend in the operation of the patent system. The role of the applied scientist and engineer in helping to reverse those trends will also be discussed.

¹Senate Subcommittee on Patents, Trademarks and Copyrights, Study 1, p. 18. 84th Congress, 2d Session (1958). It should also be noted that the Patent Office would still not be equipped to investigate prior use or sale, which are other bars to a "valid" patent grant.

6.2 The Search

One of the factors treated in Dr. Bush's study is the inherent lack of thoroughness of the search in the Patent Office as to the possible novelty of invention, as a result of (1) limitations in material to be searched and methods of searching, (2) the relatively small examining corps, (3) the limited budget for Patent Office operations, and (4) the limited time that can be given to each case by an examiner. The thoroughness with which examiners search the prior-art patents and publications, and on the basis of which they decide whether or not to grant a patent, is really not well controlled, though it represents an excellent compromise in the light of the above mentioned limitations.

Dr. Bush and others feel that, if this search were improved to make it more thorough and exhaustive, the courts would perhaps give more weight to patents, and would not be so readily disposed to throw them out. These men propose larger appropriations from Congress, increased classification and subclassification in the Patent Office to insure that the examiner will not miss anything pertinent, a much more complete examination of literature and of patents, both domestic and foreign, and the installation of computers and other data-handling machines further to assist the examiner. While there can be no objection to attempting to improve the searching procedure and thereby make more nearly certain that the patents that issue will be for really new concepts, I believe it is impossible to attain Dr. Bush's expressed hope "to insure that the patents which it [the Patent Office] issues are in fact valid ²." This statement, made also by some lawyers, appears to ignore the fact that "validity" is not arrived at by entering two and two into a machine, turning a crank to energize a logic-sequence operation, and obtaining an answer of four.

The law says that a patent is presumed to be valid. This is, however, no different from the presumption in any other branch of the law. It means that, if an inventor comes into court as plaintiff after being granted a patent following reasonable investigation, the burden of offering evidence to overcome the presumption of validity is placed upon the defendant's shoulders. But the hope that the search had been so thorough that a truly "valid" patent had resulted ignores the fact that rarely does the prior art disclose the complete device for which the patent was granted. The "validity" of the patent grant more generally rests upon the *opinion* of the court as to whether or not what was done represented an obvious extension of the prior art that the ordinary mechanic skilled in the art would have accomplished. The examiner had the *opinion* that the advance was not obvious, or within the ordinary mechanic's ability to create. The court, in its *opinion*, either agrees or disagrees with this *opinion* of the patent examiner. "Validity," or the truly "valid" patent, is thus subject to the opinion of the judge – and the opinion, even of judges as pictured by the public, is a function of a human-machine temperament, education, background, experience, intellect, and prejudice.

Are we also to pretend that a theoretical system exists, according to which the skill of the lawyers, the courtroom atmosphere, the demeanor of the wit-

²*Ibid.*

nesses, and the nature of the parties are of no consequence in the ultimate result of the truly “valid” patent? And if, as stated in earlier chapters, the United States Supreme Court is going to call upon the suggestions of Cellini in the sixteenth century³ to overthrow a patent in the mid-twentieth century – a patent representing an invention that had solved a long-time problem and the solution of which no one could see in Cellini except certain Supreme Court judges whom Justice Jackson characterized as having a “passion” to strike down patents – we might just as well abandon the hope that a more thorough search will result in the truly “valid” patent.

Another illustration is found in a case⁴ where the judge had before him the very same prior patents that the examiner himself had considered in the Patent Office, and on the basis of which the latter had ruled that invention was present. The search, thus, was perfect. The defendant was not able to find prior art any better than that which the examiner had fully considered. The judge admitted that the best prior art had been “cited by the Patent Office Examiner and his allowance of the claims of the Kline patent was a finding on his part that the patents do not disclose a tensioning spring with means of adjustment.” The court continued: “With this I do not concur.” And then the judge went on to say that all the inventor had done was to employ “familiar applications of mechanical skill respecting adjustability.” The court, therefore, on the same record as that before the technical patent examiner, reached the conclusion that the advance made was due to mere “mechanical skill,” an adjustment that any mechanic could have made, and hence lacked the unobviousness for which a patent should be granted.

So long, therefore, as the real test of invention is a matter of the *opinion* as to whether or not what has been done represents a real advance, how can this affect the matter of perfect searching? The court can always disagree with the Patent Office opinion, particularly if the court is imbued with the before-mentioned “passion.” Hence I am convinced that, while more thorough and easier searching is a desirable end, Dr. Bush’s hope that this will result in truly valid patents is vain. The late Supreme Court Justice Jackson, as previously noted, has frankly admitted that “the only patent that is valid is one which this Court has not been able to get its hands on.”

Suffice it for present purposes, therefore, to state that if one can now be thwarted in court by the writings of Cellini in the sixteenth century, it will require not only the detailed cataloging of the mere 11,000,000 documents presently accumulated in the Patent Office, but almost every piece of literature ever recorded – including the fantastic predictions of science fiction⁵.

6.3 Opposition Proceedings

The next proposal made in this Bush study is to set up in this country a system of opposition. When the Patent office intends to grant a patent, it must publish

³In the *Jungerson* case. See above, p. 65.

⁴*Kline v. Creative Textiles Inc.*, 146 F. Supp. 65.

⁵236 F. 2d 713 (1958).

that intention and thereby permit any interested person to oppose the grant by presenting evidence to the examiner in the Patent Office which may dissuade him from issuing the patent. In this way, it is hoped, the court will feel that the public has had an opportunity to call the attention of the Patent Office to the very best prior art in existence so that, if the Office should grant the patent, the presumption of validity would be strengthened. This proposal, however, is also really based upon the hypothesis that the inadequacy of the search is at least one principal reason why the courts have thrown out patents. I shall now endeavor to show that there is no validity to this hypothesis, and that instituting such an opposition proceeding would only delay the issuance of patents and complicate further the procedure and expense of trying to obtain a patent in the many thousands of cases where there will be no litigation.

Of sixty decisions of the various Courts of Appeals prior to 1963, in which patents were invalidated upon the ground that they did not disclose a sufficiently important advance over what had been done before to warrant such a grant, the court specifically indicated in eight cases that it was invalidating the patent on the basis of new art that the Patent Office had overlooked. In my study of some of those cases, moreover, based on my education and experience as a physicist and a lawyer, I came to the considered view that the so-called "overlooked" patents were actually no more pertinent than the ones actually considered by the examiner. As a matter of fact, the Court of Appeals for the Seventh Circuit remarked that

it is as reasonable to conclude that a prior art patent not cited was considered and cast aside because not pertinent, as to conclude that it was inadvertently overlooked⁶.

The patent examiner cannot possibly cite all the patents that bear on a given invention. He picks out what he considers the closest to an anticipation of the applicant's concept, and places on the applicant the burden of demonstrating that he has exercised invention.

In seven of the Court of Appeals decisions mentioned above, moreover, the courts were perfectly satisfied that the Patent Office had made a thorough search, and so did not rely on any additional prior art to that cited and considered by the examiner. They just had an opinion different from that of the Patent Office as to the matter of invention.

For the remaining cases of this group of decisions, there is nothing to indicate an inadequate search.

It does not appear, therefore, that the courts are primarily rejecting patents because of inadequate search. How, indeed, can a more exhaustive search solve the problem of disagreement between a court and the examiner as to whether a given step represents the work of a mere mechanic or of a creative inventor? If the reason for opposition proceedings rests upon the supposition that the court must be convinced that a thorough search has been made, it seems that the underlying hypothesis has been proved fallacious.

⁶*Helm v. Lake Shore*, 107 U.S.P.Q. 313.

While all patents represent potential litigation, and should therefore be carefully prosecuted by attorneys and closely scrutinized by the Patent Office, the District Courts throughout the land actually adjudicated only about 0.3 per cent of all patents during the period from 1948 to 1963. Opposition proceedings in every case would have resulted in holding up the issuance of 99.7 per cent of the patents for the supposed benefit of three tenths of a per cent. Still, even this might be worthwhile if the courts could thereby be persuaded to dispense justice fairly and so to contribute to a constructive and healthy growth in the law of patents.

We can obtain a clue, however, from what happens in foreign countries that actually do employ opposition proceedings. In Great Britain, there is no rigid examination, such as we have here. After an application is accepted, however, it is published for opposition. The grounds for opposition are the same as those for invalidating a patent in an infringement suit, namely anticipation by prior inventors and prior use or disclosure in Great Britain. In 1958, for example, 18,531 patents were sealed, but only 382 oppositions were filed. In Great Britain, furthermore, there is also a delayed opposition. Any time within twelve months of the issuance of a patent, revocation proceedings may be instituted, but in 1958, there were only 81 such proceedings. So the total of oppositions in Great Britain that year was actually about 2.5 per cent.

If this country could operate with but 2.5 per cent of oppositions, these proposals might warrant some consideration. But it should be pointed out that, in the period from 1950 to 1960, without any real search or any statutory presumption of validity inuring to the patent, such as supposedly exists in our law, the appellate courts in Great Britain sustained more than half of the patents before them. This seems to reflect an attitude of property rights and of encouragement of new ideas, new products, and new industries, different from ours.

In Holland, a country that has a rigid patent-examination system, 10,593 applications were published from 1951 through 1954, 803 of which were opposed, or about 7.6 per cent. Again, this is a relatively small proportion. As a result of those oppositions, however, the Dutch Patent Office reconsidered its decision to grant the patent in slightly more than half of the opposed cases; so mistakes were apparently caught before the patent grant.

In Sweden, another country with a rigid examination system, 5,005 patents were published for opposition in 1954, of which 409 were opposed, approximated 8 per cent.

The real test, however, comes in calling attention to the one country closest to the United States in aggressive industrialization, namely West Germany. The situation there provides a real indication of what might happen if oppositions were instituted in the United States. The German search is rigid, just as ours is; but it has not been my experience that the search made by patent examiners in Germany, even as a result of opposition proceedings, is any more thorough than that in the better examining divisions or groups of the United States Patent Office.

After a German patent is published by the Patent Office for opposition, interested outsiders may file opposition briefs and sometimes appear at oral

hearings, to try to persuade the Office that the patent should not be granted. In 1954, 16,743 applications were published, and 5,710 were opposed – 34 per cent of the total number of published applications.

Oppositions in more than a third of the cases in the United States would play havoc in the overburdened Patent Office, and would make the way of the small inventor and the small company even more unbearable. Large companies and even smaller organizations would undoubtedly oppose almost all patents in their fields as a matter of course, and we would probably have something like 80 per cent or more of all patents opposed, in contrast to West Germany's slightly more than a third.

And to what advantage – particularly where it is doubtful whether the supposed inadequacy of the search is what fundamentally influences the court to throw out patents? Again we query: Would opposition proceedings have helped in the *Jungerson* case where the Supreme Court reached back to the suggestions of Cellini in the sixteenth century to throw out a patent in the twentieth?

6.4 Technically Trained Tribunals

We come now to a third proposition, namely, that there should be a special scientific or technical tribunal that would find scientific and technical facts for the judge. Dr. Bush says, "It is unreasonable to require judges, skilled in the law but not in science, to judge the merits of highly technical or scientific matters ⁷." Similar remarks, however, apply to litigation in other fields, economics, admiralty, medicine, and other specialized areas in which the lay judge generally is not trained. The question really resolves itself as follows: Has the invalidating of patents been shown to reside in a wrong understanding of the science or the technical points involved?

Rarely does one hear the complaint that a judge who has conscientiously done his "homework" did not understand adequately the scientific issues involved. These are always reduced to common, simple terms that an intelligent lay judge can understand. Technical experts on each side explain the few crucial points in everyday language, with analogies to matters understood by the court.

There is room for complaint, however, where the judge abdicates and makes no real effort to do a conscientious job. Most patent lawyers appear to agree that they much prefer the judicial temperament of a judge who hears all kinds of cases, and can himself weigh the issues in a patent case – provided that he is free of the "passion" to which Justice Jackson referred. Reliance upon factual determinations by a technical advisor is dangerous, particularly in view of the fact that, once a technically trained individual knows the solution of a problem, that solution often has become obvious. By virtue of his very training, a man with only technical training is not usually equipped to determine whether an advance was or was not something a skilled mechanic could have done. It is the judge who is trained to weigh and deal with obscure standards which define the

⁷Senate Subcommittee on Patents, Trademarks and Copyrights, Study 8, 86th Congress, 2d Session (1961), cites numerous instances where court-appointed experts have been used to explain details.

“mechanic skilled in the art” in patent cases and “reasonable or prudent man” in negligence cases.

The British patent bar has succeeded in relatively recent times in having a judge with some engineering background appointed to hear only patent cases. Soon this judge, thus restricted in his judicial duties, fell into the rut of making such decisions as one might expect from a technician and not legally tempered decisions which reflected judicial perspicacity and temperament. Within a very short time, the House of Lords had to reverse this judge in seven of his patent decisions. One of our British associates appraised the judge as having become “lost in technical aspects without judicial consideration.”

Another illustration of the dangers of a strictly technician attitude and the safeguard of impartial judicial consideration is afforded by a comparison of the decisions, involving the same invention, of the appeal department of the Dutch Patent Office (heavily controlled by its chairman, the commissioner of patents) and the District Court for the District of Columbia, in *General Radio Co. v. Watson*⁸. The invention in issue related to a discovery that, in certain kinds of autotransformers operating in industrial uses with carbon brushes that tap off different voltages from different portions of the copper winding thereof, burn-out failures were initiated by a destructive type of high-temperature copper oxide emanating from the winding itself, and not from overheating of the carbon brush and its assembly, as had been believed for years by those skilled in this art. A solution was found in preventing the development of the high-temperature copper oxide by an appropriate coating.

The examiners of both the Dutch and United States Patent Offices cited precisely the same prior art dealing with coatings for different purposes on different types of electrical devices, and finally rejected the respective applications. The technical Board of Appeals of the United States Patent Office upheld its examiner’s final rejection.

In Holland, however, the before-mentioned commissioner’s appeal department – from which no further appeal or review may be taken - overruled the examiner as to the pertinence of the prior art and found that the inventor was actually the first to have made the discovery, despite the fact that engineers all over the world had sought for many years to solve the problem. Whether motivated by a desire to protect Dutch industry, as I firmly believe from my not inconsiderable experience, or by some other conviction, the technician-controlled appeal department certainly evolved a new doctrine of unpatentability. It ruled that even though no one had solved the problem before, and since the failure could only have come either from the carbon brush side or the winding side, it *should have occurred* to engineers that if it wasn’t the carbon brush that was at fault, it must be the winding:

The Appeal Department is of the opinion that, since in the present case there was only a choice between two possibilities, no invention can be appreciated in finding the true cause of the burning-out of

⁸188 F. Supp. 879 (1960).

the known transformers (namely the cupric oxide formation on the copper turns), even when on reasonable grounds the abnormal behavior of the carbon brush would at first sight be suspected as the cause.

This confusion of hindsight with foresight, once the solution of a problem has been made clear, has been observed in many able technically trained men with whom I have worked.

The ability to put matters in proper perspective and to weigh the likelihood of events without becoming entangled in details – in short, to see the forest and not the trees – is particularly a forte of the well-trained legal mind. Thus, in overruling the United States Patent Office, Judge Morris of the District Court for the District of Columbia held:

There can be no question but that the method discovered by Mr. Smiley, employed by plaintiff, and described in the application constitutes a marked improvement over the original patented device, especially when employed in industrial plants, and that it has completely overcome the failure difficulties inherent in the original device for such use. . . . Indeed the Board did not deny the commercial acceptance and the obvious success of the method discovered by Mr. Smiley, and affirmed that “the problem of transformer failure under certain adverse conditions or operation was an elusive matter for some period of time,” and that the “problem of transformer failure was not found until an extensive research program was conducted.”

The rare interdisciplinary man, however, who combines judicial temperament with a scientific background can not only preserve rights in the matter effected by Judge Morris, but can do so with a conviction as to the technical soundness of his findings that most lay judges do not have. Couple this with creative ability, and the law of patents as well as that affecting other phases of science and technology will blossom as we grow up out of our mid-twentieth century infancy.

It is incumbent upon society – including our engineering and scientific community – to persuade the few talented interdisciplinary men of the present generation to give their country the benefit of this kind of leadership. The nation must not continue to struggle with well-meaning and able political and judicial personnel, who, though educated by early twentieth-century standards in the arts, law, and the social sciences, lack an interdisciplinary training and the real experience in technology and science that is essential for intelligent, confident, and progressive decision making in this era. Many decisions of government today turn upon scientific and technological considerations far beyond the genuine understanding of those called upon to make the decisions.

It is frightening when a judge, or a cabinet member, or a president, must rely upon technical advisors, not just for details or analyses of problems and opinions as to courses of action (which appears proper and essential), but also for very fundamental and underlying scientific and technical bases of decisions.

Who, then, really makes the decision? We desperately need the experienced interdisciplinary and creative man in government, and we must strive to educate such rare individuals if we expect to manifest the leadership and growth essential to develop America's future greatness in this age of science. Otherwise we shall merely maintain custodianship of America's prior standard of accomplishment by "politicians as usual."

Let us turn now from the general to the specific. If judges selected from among the most able practicing lawyers who have stemmed from, and have interdisciplinarily employed, a substantial scientific background and experience, and who have demonstrated record of creative talent, were appointed, this would breathe new life into the law of patents and other facets of our rapidly merging social-scientific way of life. Since such appointment is purely political (the president having power to select all federal judges at all echelons), pressure by the engineering and scientific community can conceivably have its effect. Rather than provide for the virtual abdication of decision by the judiciary (or, more generally, by governmental officers) to a technical tribunal or board of advisors, therefore, I propose the upgrading of the political and appointive officers by including some really talented interdisciplinary men who are now, almost without exception, engaged in private pursuits.

6.5 Are Today's Patents Worth Saving?

In the course of his testimony before the Senate Subcommittee on Patents, Trademarks, and Copyrights (October 10 - 12, 1955) the late Judge Learned Hand was interrogated by the late Senator O'Mahoney as follows ⁹:

Is it in your opinion a good and useful thing, I am substituting "good and new" now, for Congress to exercise the power that the Constitution gave to it to provide by law for the exclusive use of the inventions or discoveries of inventors? Is it a good and useful thing, does it promote the arts and sciences?

Judge Hand replied:

That is just the question. Nobody knows and nobody can know until they examine how the system which has been working after all for 150 years works in our present very complicated industrial society. . . . Each side is beating the air. On one hand you have a lot of people that say the country would fall down without the patent system and on the other hand you have people like Thurman Arnold, former judge in the Court of Appeals in the District of Columbia, who say the patent system has outlived its usefulness, it is no good any more, it's now a tool for misuse on the part of the big corporations.

Then, giving his own views as a result of his many years on the bench, Judge Hand continued:

⁹Senate Subcommittee on Patents, Trademarks and Copyrights, Study 1.

The place for stimulus, I think, is those people who are very competent and would be induced by that hope of a pecuniary reward to devote themselves as entirely as is necessary.

And when he was specifically asked:

In all of your experience on the bench on patent cases, have you received no glimmering or notion as to whether or not the patent law has served a useful purpose?

Judge Hand replied:

I have an opinion. . . . I think it has a great one.

At the end of his report, there are statements by officials of some of our more promising small companies and by individual inventors on what the patent system has mean to them. For example, counsel for Polaroid says ¹⁰:

The company obviously places great reliance upon its patents. Its business is very largely dependent upon its patent structure and it has from the outset followed a vigorous patent policy of obtaining protection on all of its commercial products and in addition on such developments of its research group as may possess potential commercial value. . . . We think there is no question but that Dr. Land's success in commercializing and developing his inventions in light polarizing materials was to a large extent due to the patents obtained on those inventions.

Pursuing further the question whether the patent system is worth saving, let us refer to Study 3 before this same Congressional committee and a subsequent staff "Analysis of Patent Litigation Status ¹¹." In the period from 1949 through 1960, 58.5 per cent of all issued patents were assigned to corporations. (There was no way of ascertaining how many of these assigned patents had originally been the fruits of independent inventors who later assigned their applications.) Forty per cent were issued to individuals and were unassigned to corporations. The remainder of patentees included foreigners, the United States Government, and others. Of this 58.5 per cent, however, only a little more than one-third represents the large corporations of the United States. A total of 73 per cent of all patents granted from 1939 through 1960, accordingly, were granted to individuals (private inventors or backers) who held their own patents, or to the small corporations.

The little fellow is, of course, the one who requires the most protection – and he is the one who is stimulated by the assurance of protection to risk all, and thereby to advance the progress of the useful arts. The little fellow,

¹⁰ *Ibid.*, 266.

¹¹ Senate Subcommittee on Patents, Trademarks, and Copyrights, Study 3, 86th Congress, 2d Session (1961).

however, rarely if ever reaches the Supreme Court, because the Court, with its heavy burdens, has refused to grant certiorari in certain kinds of patent cases¹². Indeed, any case it does hear that in any way involves patents is heard as a result of most unusual circumstances, as where the government joins in requesting the Court to take the case. Small corporations and individual inventors thus suffer because the lower courts feel compelled to follow in all instances the precedents laid down when the Supreme Court exercises what Justice Jackson termed its “passion” to strike down the patents of the giant corporations.

I have mentioned in previous chapters some of the many individuals whose practical breakthroughs, in many different fields, have given the technological advances that we enjoy today, and who have led to the development and growth of many new companies that play important roles in our present economy. They were small individuals when they started. Fortunately, the process is not dead. In the very recent past, many of the basic developments of the Atomic Age, so called, were brought about by individuals, not by the larger companies and not by government-sponsored research. This is the history of Einstein, Rutherford, Fermi, Dunning, Edgerton and others, working originally as individuals in college laboratories and the like.

Former Patent Commissioner Casper Ooms points out¹³:

Many of the names of large corporations of today are the familiar names of the individuals who founded them; Westinghouse, Dupont, Goodyear, Singer, Ford, Edison, Bell, Wright – the list is endless. The individual is not yet to be discarded. It is from his single mind and single-minded purpose that invention comes far more frequently than most suspect or than the statutes reveal. Look not alone to the great contributions of the 19th century but look to our own generation or even this decade. There was De Forest with his triode, Armstrong with radio circuitry, Land with the Polaroid camera and so many others. The inventor working alone. Small business growing upon the advancing the individual’s contributions, and all in fields in which large corporate enterprises with vast and proved research facilities were outdistanced by those single minds and the small businesses in which they worked. Yet in spite of these superior facilities and the broader range of interests to which the research of these larger institutions is directed very frequently the “break-through,” the startling innovation comes from small business and small laboratories. . . . Small business is a challenge for the bold and venturesome who ask only that they be permitted to continue the fight under the rule under which they have so successfully fought mediocrity, stagnation, and decline.

¹²Since the passing of the 1952 Patent Act, the Supreme Court has declined to review every case submitted to it in which the issue turned on the question of what is or is not invention under this law.

¹³“Patents, Small Business, and the Age of Research,” in *Journal of the Patent Office Society*, Vol. 40, p. 5 (January, 1958).

To the same effect is the report of Attorney George E. Frost before the Senate Judiciary Committee in Study 2 ¹⁴:

It remains for the nonconformist, often an inexperienced outsider, to take the steps that lead to significant development. History is replete with incidents of this kind. The experienced designers of shoe manufacturing machinery considered and underestimated the cement process. The engineers of a smaller, less experienced concern recognized the potentialities and made a success of the process. It was the “practical” worker and “tinkerer” in a comparatively small company who devised the first successful adhesive cellophane tape and not the Dupont scientists who were working on the same problem. General Electric and Westinghouse – research-conscious organizations with large budgets – both misjudged the value of the wire type photoflash lamp. The result was that a comparatively small company, Wabash Appliance Company, exploited this product.

Recent studies at the University of Chicago by Professor John Jewkes show that of sixty major inventions since 1900 (the era of substantial industrial and government research activities), *thirty-three – more than half* – sprang from the work of *individual inventors!* Included in these inventions were penicillin, the electron microscope, the synthetic light polarizer, streptomycin, the domestic gas refrigerator, the helicopter, quick-freezing, the cyclotron, the ball-point pen, chromium plating, the self-winding wrist watch, and the slide fastener.

And in many cases, as history shows over and over again, important inventions are made by others than those who are experts in the field and by complete outsiders to the organized research organizations. Jewkes illustrates:

The jet engine was invented and for a time developed by men who were not specialists in engine design. The gyro-compass was invented by a youth who was neither a scientist nor a sailor. Power steering, basic radio inventions, cracking petroleum, magnetic recorders – these and other major developments occurred outside companies concerned with their use ¹⁵.

The facts thus show that we cannot rely upon government and large-company research alone if we are to maintain our technological and economic superiority in this day of serious challenge from the Soviet Union.

In reporting on a panel discussion before the American Institute of Electrical Engineers ¹⁶, S. W. Herwald revealed that the Soviets

have copied many of the good parts of our private-enterprise system.
... Incentive systems are used to encourage new ideas.

¹⁴Senate Subcommittee on Patents, Trademarks and Copyrights, Study 2, p. 18, 84th Congress, 2d Session (1957).

¹⁵John Jewkes, *The Sources of Invention*, Macmillan, 1959, p. 50.

¹⁶S.W. Herwald, “Economics and Incentive Plans,” report of panel discussion, American Institute of Electrical Engineers, Feb. 1-6, 1959. Unpublished.

Patents are one of our primary present-day incentive systems. Discourage invention by individuals and “outsiders,” and you dry up one of our historical sources of important advances.

A further article ¹⁷ reveals the following disturbing facts with regard to the pace of invention in the United States. When it is remembered that all government-sponsored research contracts require patent disclosures; that the government itself employs at least five different and independent agency staffs of patent attorney working full time to file applications to protect the government on patentable advances; and that private industry still scrupulously files for patents at least for defensive purposes so that it may make its own products without lawsuits; then it will be seen that the number of patents may be some kind of an index of the number of inventions made in this country. I have drawn the following conclusions from the data presented in the article referred to:

1. While research and development spending has risen *tenfold* from 1930 to 1960, the number of patents issued each year has remained substantially the same.

2. There is a lower yield of invention in government research work and mixed government-industry research work than in industrial-commercial work.

3. In today’s industrial research laboratory, each invention probably represents a minimum of about 7.5 man years of effort.

4. The national *average* of effort underlying each patent issued to an American corporation appears to be about 30 man-years.

5. The United States, in the community of Western-bloc nations, is below Switzerland, Sweden, Germany, Norway, Denmark, and Great Britain in per capita inventions.

Can we afford, in these perilous times, to do less than maximize the effectiveness of *all* our incentive systems, including patents?

While the foregoing discussion, it is hoped, demonstrates that patents still serve a vitally important function today, particularly in the case of the individual inventor or small company, the question is frequently raised whether patents do not stifle progress, particularly when in the hands of corporate enterprises. Why this question should even arise today – when many corporate giants have abdicated to the wishes of our government antitrust lawyers, and have, in effect, thrown open their patents to avoid litigation – is hard to understand. As former patent commissioner Robert C. Watson, now chairman of the Advisory Council of the George Washington University Patent Foundation, has pointed out:

As a result of the RCA, IBM, and A T & T [consent] decrees, 22,500 patents were dropped down the drain, so to speak thrown open, and I’m wondering when and where an evaluation of the economic effect of this disaster will ever be made ¹⁸.

In answer to this question of patents allegedly stifling rather than promoting the progress of the useful arts, moreover, I might refer to a typical example.

¹⁷Frank A. Howard, “The Lagging Pace of U.S. Invention,” *Product Engineering*, July 18, 1960, p. 75.

¹⁸Samuel W. Bryant, “The Patent Mess,” *Fortune*, Sept., 1962, pp. 111-112, 226, 231-232.

When the Radio Corporation developed its color-television tube, the so-called shadow-mask tube, CBS-Hytron was prodded, *not* discouraged, to develop improved methods of making such tubes; General Electric Company developed the alternative post-accelerator type of color tube based upon a different principle; the late Professor E. O. Lawrence developed the Chromotron, based on still another principle; and the Philco Company developed the “Apple Tube,” based on still another technique. Thus the issuance of patents, even to large corporate entities, does not stifle progress. On the contrary, it impels other corporations to find ways of getting around the patent, and in that sense admirably serves the purposes of Article I, Section 8 of the Constitution.

The present utility of a patent-sparked competitive system as compared with solely government-sponsored research and development is discussed also by Attorney Frost ¹⁹:

Experience with government-sponsored research and manufacture – where the pressures of competition are normally absent – also brings out the value of competition in research. It was a group of “outsiders” who insisted that the gaseous diffusion process be pursued to separate isotopes in the atomic bomb development – and this process ultimately proved most successful. In the wartime synthetic rubber program, the RFC, thinking primarily in monetary terms, first authorized only the construction of butadiene plants based on petroleum as raw material. Yet it turned out that 80 percent of the butadiene produced in 1943 came from the alcohol-base plant constructed under pressure from Congress. The postwar experience in synthetic rubber is even more revealing. . . . An analyst of research progress in industry reports that all of the 6 major postwar technical developments, however, have come in large measure from 4 companies that did not participate in the government program and conducted research in a competitive atmosphere. Similarly unsatisfactory experience has been reported in connection with government-contracted development in aircraft engines. The lesson of history is clear. . . . The patent system is a powerful force toward maintenance of a competitive atmosphere. Existing concerns are forced – upon pain of payment of royalties or even foreclosure from a successful development – to explore all alternatives with an open mind. On the positive side, the availability of patent protection encourages the entrance into industry of new companies with fresh approaches unbiased by mental blocks that often result from experience.

To give another illustration: At the time the atomic energy program reached the point, during World War II, where it critically needed certain specialized electronic apparatus, it was merely necessary to adopt the inventions of a professor who, in our free economy and under the encouragement of our patent

¹⁹See above, fn. 13.

laws, had previously been stimulated to develop the art. What if, however, he had not struck out on his own?

6.6 What is Wrong

But what faces the professor, other individual inventors and small businessmen today? They face the “passion” mentioned earlier and the apparent fact that the only valid patent is the one that the Supreme Court cannot get its hands on. And they face the likelihood that the lower courts will follow what Judge Learned Hand stated were “our orders” from the Supreme Court. They face, also, the attitude of many large companies and the government, who are convinced that they can appropriate inventions in the knowledge that the patents will probably be thrown out in court and the claimant worn down.

Recall the earlier-quoted condemnation of this practice by Judge Wyzanski. Recall, also, the situation of Professors Cady and Pierce and the American Telephone and Telegraph Company, with which I dealt previously. The scientific community, moreover, mourns the suicide of Major Edwin Armstrong at a time when he was locked in a harassing battle with several large infringing corporate enterprises in connection with his frequency-modulation patents.

Even before the complication of the present-day Supreme Court attitude, Thomas A. Edison was quoted from the *New York World* of June 3, 1900:

There is no such thing in this country as an inventor’s monopoly. The moment he invents something that is an epochmaker in the world of science and commerce, there will be pirates who spring up on all sides and contest his rights to his ideas²⁰.

Thirty years later, Edison remarked:

Counting the expense of experimenting and fighting for my claims in Court, these patents have cost me more than they have returned me in royalties. . . . We have a miserable system in the United States for protecting inventions from infringement. I have known of several inventors who were poor. Their ideas would have made them millionaires, but they were kept poor by the pirates who were allowed through our very faulty system of protection to usurp their rights. . . . I had to fight a long time in court over my claims . . . persisting in litigation sometimes for ten, twelve, or fourteen years²¹.

Another roadblock in the path of the engineer and applied scientist and the small company trying to produce new inventions is the position of some members of the patent bar itself, who have taken full advantage of the hostility of the courts by themselves challenging all patents as a matter of course. They should not now be heard criticizing the courts when attempting to sustain patents, since they taught the courts how to be hostile.

²⁰Remisen Crawford, “Patents, Profits and Pirates – An Interview with Thomas A. Edison,” *Saturday Evening Post*, September 27, 1930, p. 3.

²¹*Ibid.*

The practice of the United States Government itself in wearing down inventors claiming compensation from the government for its use of their inventions is another discouraging feature. The Department of Justice has had a policy to the effect that, when a royalty owed by the government to an outside inventor was substantial, the inventor's claim was to be denied. The inventor, in making claim against the Army, the Navy, the AEC, the Air Force, moreover, is subjected to a different investigation by the patent departments of each branch, a process extending over many years and which, if the sums involved are large, usually results in sending the inventor into court with the government cards stacked against him.

There are numerous cases, furthermore, where small companies have sold their commercial instruments to the government and then found the latter freely disseminating details of these proprietary items and letting them out for competitive bids to anyone who comes along, regardless of patent or other rights involved. Then the originators had to seek their remedies (if any) in court²².

Government contracts, as before explained, include clauses to the effect that no matter how much work a person may have done in perfecting an invention before the contract, and despite the existence or prior patents or patent applications, unless he had, prior to the contract, sufficient resources to build completely and operate successfully the invention, the government obtains at least a free license to the invention and, in atomic and space developments, it even obtains complete ownership thereof, with no obligations to the inventor.

Senator Russell B. Long²³ believes the public interest is served by vesting in the public complete title to any inventions resulting from government-sponsored contracts. His belief stems apparently from the misconceptions that the profit from government contracts is in any measure related to or compensatory for the investment in background of the contractee²⁴, or that the most able workers and companies will meekly sell their brain children for whatever the government offers, or that whoever is forced to take the government terms will be able to do the job as the "public interest" deserves. Representative Emilio Q. Daddario²⁵, on the other hand, would settle for a compulsory royalty-free nonexclusive license to the government. The late President Kennedy's recent directive²⁶ still appears to leave the government agencies to their own devices within certain prescribed ground rules, including prompt use of inventions by companies

²²See above, fn. 18.

²³Russell B. Long, "A Government Patent Policy to Serve the Public Interest," and E. Q. Daddarios, "A Government Patent Policy to Serve the Public Interest," 47 *American Bar Association Journal*, 675-681 and 671, respectively (July, 1961).

²⁴John T. Connor, "Innovators and Patents," *The Patent, Trademark, and Copyright Journal of Research and Education*, Vol 6, p. 145 (1962): "in selecting a contractor, the government takes advantage of an already existing situation in most cases by turning to a contractor with accumulated experience, knowledge, and know-how in a specific field – gained at the contractor's expense. Consequently, it can hardly be said that the government has borne the full cost of developing the invention, if one should emerge."

²⁵See above, fn. 23.

²⁶October 10, 1963, memorandum from the President to heads of executive departments and agencies on government patent policy, with statement attached. *Federal Register*, Oct. 12, 1963.

retaining commercial rights on pain of compulsory licensing; but there is still unrest in some quarters of Congress ²⁷.

But, just as any employee, consultant, or contractee with a spark of pride or spunk insists on freedom to contract with an employer or contractor as to the terms under which he will perform his work, so those who are to carry out government contracts should be entitled to negotiate freely with the government. They should be able to obtain flexible and fair terms of compensation for the use of inventions arising under different types of circumstances, even if developed with the aid of government funds. Many a talented employee or consultant refuses to consider salary alone or a pittance profit figure adequate payment for picking his brains, but insists on negotiating a return bearing more realistic relation to the value of the work to the contractor. Should government be deprived of the abilities of the most able minds, because Congress forbids government negotiators flexibility in reaching the kind of terms that such talent generally insists upon?

If we are to accede to the presently popular philosophy that we should welcome the paternalistic guidance of enlightened government, are we not entitled to expect Congress to trust its government contractors with freedom to negotiate? If government officials cannot be so trusted, but must be fitted into the "uniform policy" currently advocated in high circles, then we cannot complain because the results are uniformly mediocre. Attorney Reed C. Lawlor of the California bar ²⁸ points out that

Employees can negotiate special contracts with employers respecting their inventions. Why should government contractors be forbidden *by law* to negotiate special contracts with the government? . . . There are many individuals who refuse to work for industrial employers who require them to assign all inventions made by them to their employers. . . . These men who have refused to become employees of companies that would bind them with such contracts often form their own companies and create new industries and new businesses to the benefit of the entire public and of mankind. . . . The rights of the individuals are destroyed where laws are enacted which destroy the freedom of contractors to negotiate equitable contracts with the government which would provide fair compensation for the use of inventions developed by the contractors.

Recent Congressional hearings have, indeed, revealed a decided reluctance on the part of very talented technical organizations and personnel to offer their ideas to, or to work for, the government monopoly in space and atomic technology. Is the "public interest" served by depriving government of the talents of unusual people and organizations?

²⁷Senate Bill S1290, 1963, 88th Congress, 1st Session.

²⁸Reed C. Lawlor, "The Public Interest: Government Patent Policy and Equity," 47 *American Bar Association Journal* 972 (Oct. 1961).

As a corollary, it is simple to predict the fate of the well-intentioned, but patently immature policy of “not-for-profit” contracts now offered by government. The strong professorial sponsorship of this policy reflects the dangers of extrapolating into the real world the well-meaning theories evolved in university and other ivory-tower experiences.

It is rather ironical that we should be grabbing all rights for the state in the so-called “public interest,” at a time when even the Soviet Union has recognized and adopted our tested, but now abandoned, capitalistic schemes for stimulating creativity through reward to the individual. The Soviets, apparently unimpressed by the government ownership and control programs that today are being proposed in America, make payments, over and beyond mere salary even to their own state-employed inventors, for government use of the inventions that the state itself has financed!

Admiral Luis deFlores put it this way ²⁹:

The patent system was created to reward and stimulate ingenuity and inventiveness. Classifying a novel idea as the inventor’s property which could be reserved for exclusive use or sold or leased for a royalty permits the idea to be used openly without fear of competition for 17 years and with due recourse to law if infringed.

These rights and benefits have produced a powerful incentive for people to exercise their ingenuity and devote their efforts to finding new, improved ways to do things and new tools with which to do them. There is no doubt that the existence of the patent and patent rights has had a profound influence on the rapid industrial growth of our country and served to bring native ingenuity to the force.

In recent years, however, there has been a tendency on the part of the government to appropriate patent rights of individuals which will reduce and tend to kill the incentive they were originally designed to produce. History tells us that socialism, despite its well-meaning ideals, just doesn’t work in the competitive world in which man has evolved. Man’s natural tendency is to try to outdo his fellow man. If his efforts are not rewarded or are frustrated by rules, he will drift aimlessly.

We also have a tax situation where, except for a previously discussed capital-gains benefit given to a restricted class of patent holders, there is no opportunity for the research organization or the individual investor to recoup from his successes the costs of his unsuccessful experiments, thus insuring funds for further work. The newly formed Academy of Applied Science is hard at work analyzing the real needs of inventors and commercial research institutions so that a sensible, planned tax incentive program can be suggested which will reward and stimulate the ultimate goal of successful innovation.

²⁹ “Ingenuity: A Quality of Victory,” *The Technology Review*, Vol. 64, No. 8, pp. 35, 36 (June, 1962).

Where is the incentive today? Of course, a few of the more hardy will always go ahead and take risks. But is it any wonder that in the office of many patent lawyers are new ideas for further development that are not being actively exploited? Or that the inventor today is wary of sinking money into the inventor's wild idea? Where is return? Where is his protection?

It is surprising that most new entrepreneurs go to the government for sponsorship, and then get tied down to work only on those things which the government employees dare to authorize. Rarely can they work on the radical and unusual things that have seemed "impossible" but that have given rise to the creation of new industry in the past, and rarely with the all-important freedom to take advantage of serendipity, for exploring the unexpected discoveries of a project often more important than the original goal? Is it any wonder that many clients are not interested in adapting their own commercial advances to government purposes³⁰?

It is ironical that the totalitarian menace to our way of life should be encouraging research and invention when we are in the process of destroying the patent system and encouraging the piracy of proprietary rights. The part played by the courts is believed to be the most significant agent in such encouragement, since its checks and balances should have been used to correct the abuses by other branches of government that have gone hog wild. The real crux of the situation is explained frankly by Justice Douglas:

The Justice comes to formulate *his own views*. The reexamination of precedent in Constitutional law is a *personal matter* for each judge who comes along³¹.

In keeping with this philosophy, apparently, such judges as a *personal matter*, have determined that they do not agree with Article I, Section 8 of the Constitution, providing authority for the granting of patents. In a recent book, John P. Frank, former law clerk of Justice Black, frankly admits that "Black has pronouncedly unfavorable views on the patent system." In order to thwart this "passion," the late Justice Stone, says Mr. Frank "though he assigned Black many good cases, . . . never assigned him one that had to do with patents³²."

The readiness of the present Supreme Court, moreover, to utilize "particular constitutional clauses to force states to conform to a social philosophy as policy espoused by a majority of the Supreme Court" is well recognized³³.

In a recent address before the American Bar Association, Justice Arthur Goldberg seemed to reiterate the philosophy of Black and Douglas, apparently also shared at least by Chief Justice Earl Warren and Justice William Brennan,

³⁰ "State Business - Where are the Tinkerers?" *Time*, September 21, 1962, p. 81. "Instead of innovation in the area of consumer products, there is modification and trimming up . . . stiff government laws may be stifling inventiveness. . . ."

³¹ William O. Douglas, *We the Judges*, Doubleday, 1956.

³² John P. Frank, *Marble Palace*, Knapp, 1958, pp. 77-78.

³³ J. R. Schmidhauser, *The Supreme Court as Final Arbiter in Federal-State Relations*, University of North Carolina Press, 1958, p. 185.

Jr., that the function of the Supreme Court is to act as the “national school-master” who knows what social institutions are and are not good. Justice John Marshall Harlan, in rebuttal, cautioned however ³⁴;

One of the current notions that holds subtle capacity for serious mischief is a view of the judicial function that seems increasingly coming into vogue. This is that all deficiencies in our society which have failed of correction by other means should find a cure in the courts . . . Some well-meaning people apparently believe that the judicial, rather than the political, process is more likely to breed better solutions of pressing or thorny problems. This is a compliment to the judiciary, but untrue democratic principle.

A judicial decision which is founded simply on the impulse that “something should be done,” or which looks no further than to the “justice” or “injustice” of a particular case, is not likely to have lasting influence . . . Our scheme of ordered liberty is based, like the common law, on enlightened and uniformly applied legal principle, not on *ad hoc* notions of what is right or wrong in a particular case.

The one feature that has heretofore distinguished our system of government from that of totalitarian states has been that we were a nation of laws and not of men; that our rights were determined by some measure of legal precedent and not by the personal views of the judges. Now we have the anomaly where people not even responsible to the electorate are able to foist their own personal precepts upon the land – despite the Constitution.

Professor Rodell of the Yale Law School says:

Granted great government power to be wielded for the rest of their lives with no real responsibility save to their own prejudice-propelled consciences, the judges sometimes begin to mistake their separate selves, however liberal or conservative they may be, for God, and Supreme Court Justices are men ³⁵.

And Professor Rodell points out case after case where the decision is based, not on precedent, not on what the law is, not on what the Congress intends, but on “the judges’ personal views on morals and ethics.” The way in which the “passion” referred to by Justice Jackson can take hold is thus made clear.

6.7 The Task

Suppose, for a moment, that there were in the judiciary judges desiring to find reasons to *sustain* the property rights authorized under Article I, Section 8 of the Constitution, wherever proper and feasible, much as the courts jealously protect personal liberties under another Constitutional provision – the Fifth

³⁴Reported in *Time*, August 23, 1963, p. 17.

³⁵Fred Rodell, *Nine Men*, Random House, 1955.

Amendment. The large corporations would then no longer dare to defy the individual inventor so cavalierly. And venture capital would be encouraged to back new ideas, because of the assurance that the patent, when granted, would have a real chance of being sustained. Our economic advantage would thereby be stimulated, and *without* government subsidy.

The United States Government would no longer deny so readily the individual inventor's claims nor violate so notoriously the proprietary rights of small business. Outsiders would begin to think about government problems, knowing that they would be rewarded for their work. The whole defense effort would benefit, *without* all the thinking having to be sponsored by government funds.

Unless reform from the judiciary itself takes place, however, it is difficult to see how the court-sanctioned license to piracy can be checked, and the disastrous consequences flowing therefrom. The recent history of the Patent Act of 1952, specifically intended to curb certain Supreme Court techniques for destroying patents, shows that legislation, without a more positive and unmistakable character, cannot alone accomplish the desired end – and certainly not within a reasonably short period of time. The Supreme Court, as previously stated, has refused to hear case after case that would have led to a showdown on its interpretation of the meaning of “invention” in the 1952 Act.

Two avenues to influence the courts may be open: first, the strongest kind of language from Congress with regard to protecting inventors' rights; and secondly, new appointees to the bench who can win the respect of their colleagues because of their understanding of the inventive process and the requirements for its nurture and encouragement.

We should not be content, moreover, merely to put the patent law back to where it was before the 1930's. We need *constructive* development by the courts to suit modern times, development that comes naturally in other branches of law which, unlike patents, have been moving forward. Contrast, for example, the Supreme Court disposition of patents upon the basis of Cellini's writing of antiquity, in the *Jungerson* case, with the decision of the Circuit Court of Appeals for the second circuit in 1892, on Edison's carbon-filament incandescent-lamp patent ³⁶, where, despite the fact that

all-glass globes, with lead wires passing through the glass and sealed with it, had been used before . . . and although the prior art . . . indicated . . . the use of burners of high resistance and small radiating surface, and although pencils of carbon had been tried in imperfect vacua . . .

invention was found in the successful use of a carbon filament in an exhausted glass container. Edison had made it work!

Not only would Bell, Edison, and Westinghouse not be inventors in the eyes of the present-day Supreme Court, but Marconi was even *stripped* of the title of inventor, some forty years after the fact. As stated, in that case, by dissenting Justice Frankfurter ³⁷,

³⁶ *Edison Electric Light Co. v. U.S. Electric Lighting Co.*, 52 F. 300, 307, 308.

³⁷ *Marconi Wireless Telegraph Co. v. U.S.*, 320 U.S. 1 (1943).

because a judge . . . is able to demonstrate by a process of intricate rationalization that anyone could have drawn precisely the inferences that Marconi drew and that Stone hinted at on paper, the Court finds that Marconi's patent was invalid. . . .

and this, despite the fact that

nobody except Marconi did in fact draw the right inferences that were embodied into a workable boon for mankind.

And then, stating the real reason for the court's decision:

Judges . . . should [be] . . . vigilant against importing their own notions of the nature of the creative process into Congressional legislation, whereby Congress "to promote the Progress of Science and useful Arts" has secured "for limited times to . . . Inventors the exclusive Right to their Discoveries."

So, also, in the case of the Westinghouse airbrake (Patent 88,929 and Reissue Patent 5,504), invention was recognized, though the idea of operating railway brakes by air pressure and many of the devices employed in such operating had been conceived earlier, but not successfully applied, by others. Similar comments apply to the invention of barbed wire by J. S. Glidden (Patent 157,124)³⁸; to the invention of the alternating-current loading coil Nikola Tesla³⁹; and to many other inventions which have helped companies to start up so to build the America we have heretofore known⁴⁰.

It does not take an experienced engineer or scientist to interpret the graph of Figure 9, which shows the fate of patents in the United States Supreme Court since 1925. And what will happen if nothing effective is done? In view of the attitude of the Supreme Court in the period 1950-1952, one had only a 28 per cent chance of winning on both validity and infringement in the District Court, an 18 per cent chance of reversal of an unfavorable lower-court decision in the Court of Appeals, and no chance at all in the United States Supreme Court. Contrast this with the greater than 50 per cent chance in Great Britain, a country without a rigid examination system and without legal presumptions of validity of a patent, but with a desire to foster its economy by encouraging the creative spirit of the individual for the ultimate good of the nation.

There is still a Constitution-authorized patent system on our books which is intended to promote useful arts through giving exclusive limited-period rights to inventors. As in other phases of our wonder-working capitalistic type of economy, the rewarding of the creative individual inures to the benefit of a

³⁸143 U.S. 275.

³⁹*Westinghouse Electric & Mfg. Co. v. New England Granite Co. et al.*, 103 F. 951, affirmed 110 F. 753.

⁴⁰An interesting treatise relating to these particular patents is contained in an article by Lawrence P. Dodds and Francis W. Crotty, entitled "The New Doctrinal Trend," *Journal of the Patent Office Society*, Vol. XXX. pp. 83 - 120 (1948).

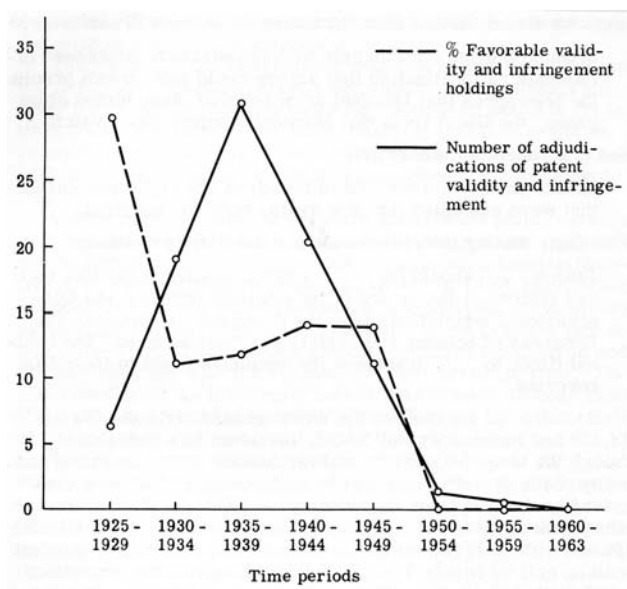


Fig. 6.1: A measure of the interest of the United States Supreme Court in patents.

whole society that progresses through the pioneering work of the gifted few and the later industry of the many. The patent system, even though not always best suited to our present needs, represents a primary source of material reward to the creative engineer and scientist. To pass it by, or to refuse to become active in insisting upon its preservation, seems to me to be a serious mistake. It is up to the engineer and scientist to take an active interest in the patent system and to contribute the ideas vitally needed for its improvement, modernization, and, indeed, survival.

The difficulty is not with the concept of the system, but with an administration and operation thereof not fully suited to current requirements or to the direction of an unmistakable social trend apparently desired by most people.

CHAPTER 7

THE MODERNIZATION OF PATENT SYSTEMS

The possible effect upon our system of current planning for a common European patent is discussed in this chapter, with several of the author's views for modernizing and improving the American patent system and its administration.

At a time when most of the thinking at the United States Patent Office appears directed toward such matters as obtaining a new building, speeding up the government's patent examination procedures, streamlining interference and other processes within the Office, and providing more incentive to skilled people to wish for Patent Office careers, our European friends are engaged in a far more basic modernization program. More important than the details of the programs under consideration in the United States and abroad is the spirit of enthusiasm and vigor of the European experiment. This spirit stems from a firm conviction that the state benefits when individuals are encouraged and their proprietary rights are protected – concepts that, at least formerly, were an integral part of American pride and tradition. Serious revision of the basic concepts of a patent system to suit modern times cannot take place in the climate that we have now created for ourselves; where, indeed, there are some who apparently are no longer sure that reward to the individual is consistent with the so-called “public interest”¹.

Let us explore, briefly, the rather radical ideas in Western Europe with regard to the economic and social needs of a mid-twentieth-century patent system. In doing this, we must bear in mind that the great postwar impetus is still at work in an awakened European Economic Community which filings aside the petty roadblocks of mere nationalism and refuses to retain long-established systems of a bygone era simply because they have been so long established.

¹A measure of this spirit seems now to have been kindled by S. Herbert Hollomon, Assistant Secretary of Commerce for Science and Technology, who has established a patent panel of the Commerce Technical Advisory Board to delve into these matters with a sense of urgency. Also, Dr. Donald A. Schon, head of the Commerce Department, Office of Technical Services, and Professor Charles Stark Draper, Chairman of the National Inventors Council, are instituting studies.

7.1 Present Proposals for a Common European Patent and Judiciary

In an effort to meet the needs of a modern Europe, and despite the wide range of differences in national laws and requirements for the issuance of patents in Belgium, France, Holland, Italy, Luxembourg, and West Germany, these countries have banded together with the exciting purpose of trying to create a single European patent. Appreciative of the limitations upon the courts of law in the growing maze of technology, but also cognizant of the necessity for the safeguards of the judicial process, these people propose a single European Patent Office which will perform both administrative patent examining and judicial functions, complementing the processes of the national courts of law of the individual countries.

Preliminary plans ² proposed by representatives of the respective governments, and made more firm at the Berlin 1963 summer conference, are somewhat as follows:

An inventor may file for a single, common European patent either in the European Patent Office directly or in any one of the national patent offices for forwarding to the European Patent Office. The international group of examiners staffing this latter office, under financial support from all the member countries, first checks the formal sufficiency of the application papers and then forwards the application to an International Patent Institute, probably at the Hague, where an international group of trained technical officers will make a novelty search and report on the closest prior art that can be found. No opinion will be expressed, however, as to whether the claimed invention is or is not actually a patentable invention in the light of this prior art. On the contrary, one of the purposes of this novelty search is to enable the patent applicant himself to decide whether, in the light of the prior art, he actually has a patentable invention and should maintain his application or whether his claims should be modified to show more clearly how his inventive step is an advance over what has been done before.

The European Patent office will then, as a matter of course, publish the application as an initial grant, including the original or modified claims of the applicant together with the novelty search report of the International Patent Institute. The public thus will know what the applicant is claiming and what prior art the international search has developed, and any interested member of the public can make his own evaluation of such claim.

This published patent will automatically be treated as abandoned after five years from publication unless either the applicant or a member of the public files a petition for a final examination and determination of the validity of the patent by the European Patent Office. Such a petition must be published so that anyone interested in this patent-claim assertion may, within a limited time, join in the petition and inform the European Patent Office of any prior art or other reasons for invalidity of which they are aware.

²Committee of National Institutes of Patent Agents, "European Convention for facilitating the filing of applications for patents in respect of the same invention in several States and the examination thereof," Unpublished draft, June 14, 1962.

Thus, before making a final determination as to whether the initial scheme is or is not patentable, the European Patent Office examiners have before them not only the results of the search of the International Patent Institute but also all the prior-art references which the technical community of all the countries has been able to assemble. Prosecution of the claims will then place much as in the West German, Dutch, or American systems, with rejections and amendments, and appeal to a special board of the European Patent Office for a final decision.

One reason for this two-stage procedure in the granting of the European patent is the fact that the average life span of patents in countries such as Western Germany (voluntarily cut short by the failure to pay the successively increasing renewal taxes) is about seven years. And the period elapsing between the original filing of an application for a common European patent and the five-year period for final examination is expected to approximate the same length of time. At the end of that time, about half the patents will probably be abandoned, and the European Patent Office and the national courts will not be cluttered with litigation over uneconomic or unimportant patents. A party being threatened by, or concerned with, an initial or preliminary patent grant, moreover, does not have to wait for the patentee to descend upon him in order to obtain a binding determination of patent validity.

Upon election to file for a common European patent, the applicant will be barred from obtaining an individual national patent in any of the separate countries. However, for the initial phases of this proposed program, the right to file for individual national patents is retained.

In the event that a suit for patent infringement is brought in any of the national courts, after the publication of the initial patent by the European Patent Office but prior to final examination and final patent grant, the national courts, with power to decide infringement only and not validity, must suspend proceedings to enable the European Patent Office to make its final examination and rule on validity. Should the European Patent Office decide that there is no invention or that for some other reason the initial patent is invalid and no final patent of any kind can be granted, appeal may be made to a board of appeals of the European Patent Office, whose decision is final.

Even after the final granting of a patent, and at any time during its life, the public, and not merely an infringer, has the right to bring a suit before a special board of the European Patent Office for a declaration that the patent is invalid. And appeal to a European Patent Court staffed by internationally selected judges is available.

Once a final patent has been granted, however, the national courts may proceed with suits to determine whether the patent is infringed. If doubt as to validity is shown before such courts and if the validity board of the European Patent Office of the European Patent Court is also to consider the matter, the national courts may, if they so desire, postpone infringement decisions until the final decision on validity has been rendered by the European Patent Court. In such infringement actions, the national courts may request the European Patent Office to act as an expert as to technical matters, including the scope of protection intended for a patent, or they may request the European Patent

Court to interpret doubtful provisions of European patent law. The decision of the courts as to infringement may be appealed to the national appellate courts, as in present-day fashion, but the final appeal will not be to the supreme courts of the individual countries but to the European Patent Court.

Instead of waiting to be sued for infringement in a national court, moreover, any person who is concerned over whether or not he may be infringing a patent may ask the before-mentioned special board of the European Patent Office to declare whether his product or process is an infringement. The resulting determination may be appealed to the same court, but a decision of the European Patent Court as to infringement is to be binding upon the national courts. Thus national judicial sovereignty is being radically curtailed in an effort to establish common standards of validity and infringement and uniformity of law under the supreme guidance of the European Patent Court.

More than this, litigation in the national courts and prosecution of economically useless patents in the European Patent Office are to be minimized. Searches, examination, validity, and infringement proceedings are to be streamlined and standardized, as they must be if the present terrible waste of time, effort, and skilled manpower (involved in separate national patents, competing patent offices, separate judicial procedures, and varying standards) is to be eliminated.

These radical and far-reaching modernizing steps, in the race for survival with an aggressive, enthusiastic, and hostile competitive society³, are being considered abroad at a time when, in the United States, there is more concern with putting the law back to where it was forty years ago; with having a spanking new building for the Patent Office; and with speeding up the searching and cutting short negotiations between attorneys and the Patent Office. Indeed, we seem to consider ourselves clever enough to produce the "valid" final patent in shorter and shorter time, despite the increasing problems involved: obtaining and holding competent career examiners and the growing complexity of technology. This is how we have always done it, and apparently all that is needed to introduce time-study and efficiency "experts" and computers to speed up the process.

A lesson for present-day American from its elders can be gleaned: namely to concern ourselves with substance, not form, and not to cling to procedures and format which have proved themselves long out-dated economically, socially, and politically⁴.

The economic and political effect upon the United States of real progress in the *competent* administration and *sympathetic* protection of industrial property in Europe is another issue with which apparently few, if any, in government are presently concerned. If America is to be a world "leader" forging "new frontiers" in fact, and not merely in fine words, platitudes, and wishful thinking, it must shore up the sagging foundations of our free-enterprise capitalistic society before

³Edward E. McGrath, "How Should the U.S. React to Reds 'Man-in-Space Feat'," Boston Globe, April 13, 1961.

⁴Report No. 148 of the Senate Committee on the Judiciary, 87th Congress, 2d Session (1962), p. 12: "The very survival of the patent system, as it now exists, is at stake."

adding floors to the superstructure.

What are the reasons behind our out-dated Patent Office procedures and the general hostility or lack of interest and a sympathy for industrial property protection from top to bottom of our judiciary? It is no accident that both Republicans and Democratic judges are less than cordial to patents and complaints as to unfair competition predicted upon proprietary rights. It is no accident that vast groups of our industrial society have become less than enthusiastic about patents and about fighting to maintain their proprietary rights. It is no accident that our engineering community is far from "on fire" and, like many other groups in our society, looks for security rather than for the excitement and adventure of its work with dreams of giant rewards.

By recent interviews of applied scientists and engineers in university, government, large corporation, and small company electronics laboratories in greater Boston, interviews conducted by my classes in invention, patent, and innovation at the Massachusetts Institute of Technology and analyzed by the Academy of Applied Sciences, a shocking apathy was uncovered. Those working under government sponsorship or employment felt no personal incentive from the patent system and, indeed, showed no concern for patents whatsoever since the latter would be the property of the government. In many cases, they reported that the lack of recognition of their personal efforts, coupled with the great difficulty in persuading superiors to try out something new or radically different, was responsible for their attitude of doing a day's work for a day's pay.

In one major space laboratory, it was frankly conceded that if the germ of a really novel concept came to mind, it would be brought to completion in other commercial company endeavors outside the NASA program, because of the grab-all patent policy of the government. This puts a premium on solving NASA's problems safely and regularly. Three patents applications, to be sure, have been filed in the past four years out of the millions of dollars of space research conducted by this laboratory; but the commercial section of the same company has filed hundreds of such applications during the same period.

Much as the government patent policies have quashed creative ingenuity, so the company employment agreements have reduced the interest of the engineers in inventing. Two principal reasons for this lack of incentive were advanced: first, the companies resist really new ideas; and second, the reward and recognition procedures are actually not tied to *creativity*. Most of the commercial company engineers and applied scientists who were interviewed stated that they presently had some rather new ideas that they felt would be useful as products for their companies. But they were not even suggesting them because of the difficulty and even political danger in getting new ideas considered fairly and accepted. Possible inventions in fields outside their specific employment had also occurred to many of those interviewed; but the universal explanations for doing nothing about them were either that the company employment agreement made them the employer's property, or that the time, expense, and risks involved in our present patent system were formidable. Many felt, moreover, that any recognition would go to others higher up on the company ladder. Are industry and government managers awake to this lack of morale; or don't they

realize its effect? The prevalent American management concept of equality of talent and interchangeability of applied scientists and engineers saps at the roots of creative accomplishment. Flowers will not bloom without roots! ⁵.

7.2 Some Different Ideas for Revision of the American Patent System

Looking, then, at the foundation of our American patent system, I question whether it is suited to hold up the social order of *today* and *tomorrow*. The system cannot but crumble if it rests upon fundamental concepts not in tune with modern trends. It is of no use to long for “the good old days,” because most Americans, rightly or wrongly, have unmistakably shown in modern elections that they wish to adopt a different kind of social structure. So, unless the purposes and effect of the patent system are matched to modern trends, the good that resides, even in an out-dated patent system may disappear.

We should question, for example, whether it is sensible, in all instances, to give to certain large corporations the same amount of power of exclusion in a patent that is given into smaller hands for the establishment of new businesses or growth. Is it not perhaps a terrible waste to have one branch of government (the Patent Office) grant a right after years of consideration and then to have another branch (the Antitrust division of the Department of Justice) limit or abolish such right? Isn't this particularly true where the trend of Supreme Court thinking is directed, not toward real antitrust violations, but to the possession of instruments that, if improperly used, could conceivably result in violations ⁶?

We should question whether, as the country proceeds unmistakably along the path of more and more federal supervision, in accordance with the will of the majority, the same social purpose is served by our present type of patents for inventions in the highly sensitive field of public health as exists in other less sensitive fields of industrial products. The must be examined because, though the late Senator Estes Kefauver was unsuccessful in his attack upon pharmaceutical patents in 1962, the handwriting is on the wall to be read ⁷.

The engineering, scientific, legal, and business communities of the nation should *now*, before it is too late, explore policies that can preserve the important stimuli of the patent system even under conditions where the public is highly sensitive. We who are generally friendly to the patent system shall have performed a disservice to future generations if we refuse to examine our present form of patent system to see if it is any longer as meaningful and proper in our present society as it was in the early part of this century. We shall have performed a further disservice if we do not plan to integrate our patent system with that of the European Economic Community.

With regard to the procedures, indeed, it seems that our emphasis ought to be making the path of the *inventor* easier in the Patent Office, rather than

⁵Robert H. Rines, “Current Problems in the Protection of Creative Ideas and Writings,” *IEEE International Convention Record*, Part 10 (1963).

⁶*United States v. Dupont & Co.*, 366 U.S. 316 (1961).

⁷*Science*, Vol. 134, pp. 89-90 (July 19, 1961).

approaching the problem solely from the present point of view of making it easier and quicker for the government to speed up its consideration of patents. Neither the Patent Office examiners nor any other group of individuals can do creative work in an atmosphere of speed. In fact, the examiners should better be given *more* time for thorough consideration of the matter of patentability and the application of the judicial tests of obviousness and other standards of invention, if judges are to be asked to give great weight to the examiners' conclusions. Speed is not, and never has been, a substitute for thorough work; and so we must decide whether the issuing of good patents is more or less important than the prompt issuing of large numbers of possibly inferior patents. This, again, is the question: Is America interested in substance or in mere form?

Let us consider, therefore, another approach predicated upon the hypothesis that a patent examiner is not just a servant of the public at large, but under the very constitutional provisions whereby the patent system exists also has a responsibility to the individual inventor. He should not engage merely in the destructive process of rejection, but should speed the process of patent examination through active assistance to inventors, in order that patents be issued promptly when invention appears to be present. It should be as important for an examiner to feel content when assisting an inventor in obtaining a patent with claims of proper scope as it is now for many examiners when sustained by the Board of Appeals in a rejection.

To this end, a reformulation of present Patent Office practice can be made by administrative order of the commissioner which will take into account the long-overlooked Patent Office responsibility to the inventor. Specifically, when an examiner is convinced that an invention is present but is dissatisfied with the claims of the applicant, he should be required to suggest different claims or call for an interview for the purpose of formulating such claims with the inventor or his counsel. This is the common practice of the West German Patent Office. And this is the healthy way to speed prosecution, a much better way than arbitrarily limiting the applicant to two Patent Office actions, as now proposed in so-called "compact" patent prosecutions.

Could we also move a step further in order to expedite prosecution and eliminate the necessity for so many appeals before the Board of Appeals and the courts? When the Patent Office is convinced that invention is present, but agreement as to the working of the claim cannot be reached with the inventor's counsel, might not the Patent Office thereupon give the applicant his choice: either suffer a final rejection or accept a prompt patent containing a claim of the scope that seems proper to the Patent Office; but including in the patent document claims not approved by the Office but which the applicant still feels describe the invention more fairly.

The whole purposed of claims is to alert the public as to the metes and bounds of the patent grant. No one, from reading a claim, however, understands what the claim covers or what it actually means without recourse by skilled counsel to the file history of the patent. Since counsel must study this file history to interpret the claims anyway, it would seem that he could equally well determine whether the claim granted by the Patent Office under this new

proposal was broad enough, or whether the inventor's claim represent more adequate allowable protection. The public can thus be alerted as to what the court will probably hold with regard to the ultimate scope of the patent, which seems to be the only reason for having claims in the first place.

Healthy expedition of patent applications prosecution and the elimination of much appellate procedure would appear to be the dividends accruing from such a system. This would be particularly true where the matter of presumption of validity (which would only attach to the Patent Office allowed claims) is purely a procedural benefit as interpreted in practice by the modern courts.

Another suggestion I would offer for expediting patent application prosecution is also peculiarly within the province of the commissioner to accomplish, namely to abolish some of the ritualistic and formalistic rules of claim draftsmanship. While at one time in our development of the law it was probably sound to adopt greater strictness in this regard, in order to introduce clarity and definiteness and to establish how claims should be construed, I question whether this is still valid ⁸.

In the 1952 Patent Act, Congress went part way in authorizing functional claim language ("means" plus function), with a statutory provision that this is to be interpreted to cover the kind of structure disclosed in the patent specification and equivalents. This was intended to curb court criticisms and to simplify claim drafting, consistent with permitting proper scope of coverage.

Should we not also remove, however, the time-consuming obstacles involved in trying to connect and agree with the Patent Office upon broad claim terminology, simply because the rules forbid the use of alternative or illustrative expressions, to wit; "of metal or plastic or wood or the like," or "such as electrical or mechanical or electro-mechanical members," etc? Shouldn't we re-examine these expressions to see whether they actually introduce indefiniteness and vagueness, or whether, on the contrary, they do clarify what is intended?

An additional proposal relates to encouraging prompt disclosure of ideas without fear of litigation and appropriation. It is doubtful if any agency outside the Patent Office receives so many new ideas. The Patent Office, moreover, generally receives these ideas years in advance of their publication either in periodicals or in pieces of commercial equipment; and certainly the long delay in the issuance of patents prevents the rapid informing of the public as to the contents of the applications. Is it in the public interest that our system, which requires in this era acceleration in new-product and in new-idea development, should be stymied by the secrecy with which these ideas must be held in the Patent Office until the inventor dares to risk disclosure?

I have proposed ⁹ that the Patent Office or a related arm of the Commerce Department should assume the added function of lending its good offices for bringing together promptly inventor and interested potential licensee under a predetermined set of safeguards. The inventor must, of course, be free to refuse

⁸Robert H. Rines, "Recent Attitudes – Judicial, Executive, and Legislative – Foreshadowing the Demise of the Present Form of American Patent System," *Bulleting of the Canadian Patent Institute*, January, 1962.

⁹*Ibid.*

this proposal if he so desires, and to proceed as he does now. If, however, he wishes the benefit of this proposal, he would agree (1) that the details of his invention may be brought to the attention of possible licensees subscribing to a Patent Office service and (2) that, should the potential licensee be interested, the inventor agrees to terms as provided in a predetermined set of royalty or other payment standards related to the industry involved.

Those who wish to be subscribers to or recipients of this confidential information as potential licensees, on their part, will agree to keep the disclosures in confidence and, if they decide to adopt the ideas and if the Patent Office grants a patent covering the same, to respect the patent and to enter into arrangement under the provisions of the predetermined set of standards. The potential licensees subscribing to this service would have the right to call to the attention of the Patent Office any prior art or prior use of which they are aware so that the examiner would not inadvertently issue a patent where it should not be granted. This procedure protects the potential licensee and should not hold up the prosecution of the patent applications. The potential licensee would still have rights to contest infringement, or to contest inventorship on the basis of any application then pending, but this right should probably be restricted to pending applications in order to protect the inventor from interference contested on matters that the license may have independently previously evolved but did not consider important enough to act upon. This would also encourage the potential licensee to file more punctually and thus disseminate more rapidly information beneficial for the progress of the useful arts. Toward the same end, moreover, beneficial tax provisions might be provided, though this would not be a necessary or required condition.

Under such a system, inventors would feel free to have subscribing potential licensees examine their inventions and, by subsequent direct contact, further confidential information not contained in the patent application, without fear of legal entanglements. This should also protect potential licensees from being held up by inventors who demand an unreasonable price; and it also protects the potential licensees with respect to their own independent developments and to the prevention of inadvertent issuance of patents.

All of this may be accomplished, moreover, by the utilization of the type of examiner presently employed in the classification division. Such examiners are skilled in determining the field and nature of inventions, as they are filed, and are able to correlate the same with requests that will similarly be filed by the subscribing potential licensees. It would appear to be in the decided interest of the United States Government itself to subscribe to this service. In such event, indeed, a great many of the present-day complications and distrust of the government by inventors could be eliminated.

Since the rules of practice of the Patent Office, made pursuant to the statutory authorization of the patent laws, have long recognized the right of the Patent Office to permit others to inspect applications, provided permission is given in writing by the applicant, no new legislation or other action on the part of Congress would seem to be required to institute this program. Rather, it would appear to be peculiarly within the jurisdiction of the commissioner of

patents to set up such a liaison function. The Patent Office has already assumed jurisdiction of a somewhat similar, though less comprehensive program, in connection with inviting attention to patents that are available for licensing.

This proposal, moreover, goes far beyond the concept of the National Inventors Council and the products list circular of the Small Business Administration, and should stimulate inventors to complete their thinking on ideas that relate not only to their own businesses or fields of endeavor, but to entirely diverse fields; all with assurance that such disclosure is worthwhile and does not involve the likelihood of costly legal procedures and litigation.

If we are to enjoy the luxury of having many of our best engineers and scientific people work in fields and on devices that have no bearing on pressing problems in military and other high-priority fields, we must find some incentive – the above system or something like it – which will impel these engineers and scientists to work on problems not immediately concerned with their daily duties. Certainly the important inventions that have been contributed in various fields by workers outside those fields demonstrate the value of such a result. This may be part of the answer to the problem of maintaining our freedom to select what we wish to work on in our daily lives, while competing more effectively with the Soviet society, where the very best brains are forced to work upon military and other pressing state problems.

Lastly, we should explore more promptly whether the patent system can ever be adequate as virtually the only universal *government* reward for advancements in the useful arts. Scientists and engineers are stimulated to creativity, of course, by mechanisms other than the patent system, including an enthusiasm for science or technology itself, the approbation of the scientific or engineering community, the publication of papers, the winning of a Nobel prize, and the attainment of a higher position in an organization. Privately sponsored efforts toward this goal of providing reward and recognition for various degrees of creative advances in applied science and engineering, as distinguished from those of pure science, are under way under the auspices of The Academy of Applied Science.

Furthermore, we should select that situation dealing with the useful arts and applied science in which monetary, business, and prestige rewards can be achieved through patents and modernize the patent system so that it will effectively satisfy present needs and provide the stimulation necessary to re-encourage creativity in the mid-twentieth century applied scientific and engineering community¹⁰.

Most important, however, we should decide promptly whether it is *invention per se* that we should stimulate primarily, or the executing of *actual innovation* – requiring *development and entrepreneuring*, as well¹¹. If it is the latter,

¹⁰Note also the suggestions of Albert Szent-Gyorgyi, "Science, Man, and Politics," *Saturday Review of Literature*, Oct. 20, 1962, p. 24, concerning the necessity for talented scientific people to become actively interdisciplinary in this era where "the dominant influence of science is perhaps the outstanding fact of today's world."

¹¹Not all "innovation" requires invention. Should we not seek to define "innovation," if this is what we are after, and reward it?

as I strongly suspect, then perhaps a keying of tax-preference benefits to the innovator over a period of years, rather than the creation of exclusive rights and a belaboring of the patent system, will be a more effective stimulant which, as an ancillary benefit, would carry with it great simplification of our litigation problems.

CHAPTER 8

COURT MODERNIZATION FOR AIDING THE PATENT SYSTEM AND THE LAW, IN GENERAL

Since there is a decided legal, as well as technical, side to the problems of patents and of protecting proprietary rights, a pin-pointing of difficulties in our current system of judiciary review is necessary in the interest of completeness. This is done here in language that the nonlawyer also can understand. Included are some suggestions that would have far-reaching effects for patent litigants as well as all those having property rights.

The suggestions for improving the attitude of the courts toward the property rights of the creative individual, in order restore incentive to our present patent system, are arrived at perhaps piecemeal. If the Supreme Court's hostility to or disinterest in patents is overcome, there may still remain other personal prejudices relating to other facets of the law. A more generalized proposal for trying to remedy all these disturbing influences is thus in order, especially since we recognize the fact that the complexion of the court cannot be changed overnight.

8.1 The Nature of the Criticism

Altogether apart from partisan or ethnic dissatisfaction with decisions of the Supreme Court in particular cases (which will probably always persist but may perhaps be tempered by a better selection of justices from many legal fields and experiences) there are serious, more deep-seated worries among legal professionals. They are naturally reluctant to criticize the august institution, not because of undue awe for the intellects or judicial perspicacity of the appointees to the high bench but, rather, because of the importance of the historically stabilizing effect of prior courts upon our way of life.

Informed criticism of the conduct of the Supreme Court covers a wide range. Some critics feel, generally, that the number of cases crowding the court makes impossible well-considered, well-written decisions, worthy of respect. Professor Henry M. Hart, Jr., of the Harvard Law School, has presented "The Time

Chart of the Justices¹” showing the actual impossibility of reaching conscientious, erudite decisions under present conditions, quite apart from fair play for litigants. Under Professor Hart’s assumptions, the justices, if in fact they do study all petitions and appeals, can give each of 1300-odd annual petitions for writ of certiorari and appeals about ten minutes’ consideration²:

Others feel that they court pays little attention to, and indeed is disposed to ignore, many, many fields vital to our way of life, including patents, copyrights, and property rights in general, in favor of multitudes of perhaps nationally trivial, minor abuses of other kinds of rights³. Among the justices themselves, indeed, there appears to be great resentment over the conversion of the Supreme Court into an appellate tort court:

To review individualized personal injury cases, in which the sole issue is sufficiency of the evidence, seems to me not only to disregard the Court’s proper function, but to deflect the Court’s energies from the mass of important and difficult business properly here⁴.

Many lawyers object strenuously to the philosophy that justices – appointed for life – should foist upon an electorate their own personal views as to matters of social, economic, and legal conduct. Still others decry the lack or respect among certain justices for legal precedent, the legislative functions of Congress, and the historic duty of the Supreme Court to try, at least, to bring some measure of stability and order to our judicial and legal processes. In the Holmes Lectures at Harvard in 1958, Judge Learned Hand frankly explained this dangerous condition:

I trust it is not disrespectful to say that I find it impossible to predict what attitude the Court would take towards a statute of which it much disapproved even where it concerned economic issues only; and ... the answer becomes decidedly more obscure when the statute touches those other interests, now called “Personal Rights⁵.”

How correct was Mr. Justice Roberts’ earlier prediction in *Mahnich v. Southern S.S. Co.*⁶:

The evil resulting from overruling earlier considered decisions must be evident. In the present case, the court below naturally felt bound

¹73 *Harvard Law Review*, pp. 84 - 125 (1959).

²By the same computation formula, the ten minutes had been whittled down in 1960 and 1961. 74 *Harvard Law Review*, pp. 99, 100 (1960) and 75 *Harvard Law Review*, pp. 85, 86 (1961).

³Robert H. Rines, “Some Legal Considerations in Presenting Technical Information,” *Institute of Radio Engineers Transactions*, Vol. EWS-2, No. 3, pp. 84-88 (1959); Harry G. Hehn, “Current Developments in Copyright Law,” *American Bar Association Ninth Annual Symposium on Copyright*, p. 10.

⁴Mr. Justice Stewart, *Sentilles v. Inter-Caribbean Shipping Corp.*, 361 U.S. 107, 111 (1959).

⁵“Personal Rights” refers to the Bill of Rights.

⁶321 U.S. 96, 113 (1944).

to follow and apply the law as clearly announced by this court. If litigants and lower federal courts are not to do so, the law becomes not a chart to govern conduct but a game of chance; instead of settling rights and liabilities it unsettles them ... and ... the deplorable consequence will inevitably be that the administration of justice will fall into disrepute. Respect for tribunals must fall when the bar and the public come to understand that nothing that has been said in prior adjudication has force in a current controversy.

And coupled with this is the apparent philosophy that the ends of justice are served by attaining the desired result of favoring or disfavoring a class of litigant, even if this is done on the flimsiest of rationalization. In the words of one of our ablest federal judges ⁷:

In my opinion there was no evidence whatsoever of negligence on the part of the engineer. I cannot read the record as a whole in a way to find any evidence of negligence. But I know that my method of reading the record is different from that of a majority of the Supreme Court of the United States as exhibited in past cases, and *I hope I am a lawful judge*, and I recognize the limits of my authority, *whether appellate judges do or not*.

The host of relatively recent Congressional countermands of the effects of the Supreme Court decisions demonstrates, others point out, an unhealthy conflict. The readiness of certain justices to overturn long-established and well-considered law and legal rules, to attain a given result, has been particularly frustrating to conscientious law-enforcement officers, also. Recent episodes of this character are illustrated by *Rios v. United States* and *Elkins et al v. United States* ⁸. Under this procedure, we may expect newly fashioned reversals of law every time that the court changes its members, or the members change their personal views.

As another illustration: in reviewing the past two decades, without first looking at the actual decisions of the Supreme Court, I found it possible to predict with almost 100 per cent accuracy, which justices would ultimately decide against the patentee. And this was true even in the absence of knowledge as to the merits or issues of a patent case or a case in which a patentee was somehow involved.

While recognizing the necessity for the justices to exercise discretion in matters of certiorari, many lawyers protest the clear usurpation of Constitutional power by the court in declining to hear matters concerning which the Constitution directs that the Supreme Court “*shall* have the appellate Jurisdiction.” It declines by dismissing appeals for “want of a substantial federal question.” If the work load is too onerous, some feel ⁹, it behooves the court to protest

⁷Judge Charles E. Wyzanski, Jr., *New York, New Haven & Hartford Railroad Company v. Henagan*, as quoted and aff., 272 F. 2d 163, 155 (1959).

⁸364 U.S. 253 and 364 U.S. 206.

⁹62 *Harvard Law Review*, pp. 488-496 (1948-1949).

to Congress, since the Constitution distinctly provides that the Supreme Court “shall” hear appeals “arising under this Constitution” and “the Laws of the United States,” and that it is the province of Congress, *not* the court, to make “Exceptions”¹⁰.

Every active practitioner before the court feels the frustration of this free and easy fiat by which

The Court has for some years been in the process of interpreting away the difference between appeals and certioraris, reducing the appeals also to a matter of its own discretion¹¹,

despite the Constitutional mandate, so that today

it has long since become impossible to defend the thesis that all the appeals which the Court dismisses (for want of a substantial federal question) are without substance¹².

In connection with the practice of my own firm, for example, I would inquire

1. Whether a case involving a construction of a State statute that authorized deprivation of a right to trial by jury by an order for a new trial, issued pursuant to a secret hearing, held without notice, in a locked private room of the court house from which counsel was deliberately excluded by a judge, presents no “substantial federal question”¹³.

2. Whether a case involving a novel construction of the Patent Act of 1952 that permitted the destruction of a patent for a device that the Court of Appeals¹⁴ had to admit was (1) “useful and ingenious,” (2) “not known prior,” (3) had “solved these problems” of the prior art, and (4) had “commercial success” (in short, all the tests heretofore known to the law for demonstrating patentable invention) was of import for decision; particularly where, under similar circumstances, other Courts of Appeals had interpreted the Act contrarily, and the parties before such Courts of Appeals joined with plaintiff in seeking a first interpretation from the Supreme Court of the Act¹⁵.

3. Whether a patent for an invention widely used in radio can be valid in one circuit and invalid in another¹⁶.

¹⁰Art. III, Section 2 of the U.S. Constitution.

¹¹John P. Frank, “The United States Supreme Court: 1950 - 1951,” *The University of Chicago Law Review*, Vol. 19, No. 2, pp. 165, 231 (1952).

¹²73 *Harvard Law Review*, pp. 84 - 125 (1959).

¹³*Rines v. Justices of the Superior Court*, 330 Mass. 368, appeals dismissed, 346 U.S. 919.

¹⁴*Glagovsky v. Bowcraft*, 164 F. Supp 189, 190; 1 Cir., 267 F. 2d 479 (1959), certiorari denied 361 U.S. 884.

¹⁵The Supreme Court has denied every petition to date for an interpretation of what is and is not patentable under the Patent Act of 1952, despite the conflicts in the Circuits and despite the fact that the Patent Office, totally in the dark, is granting thousands of patents weekly!

¹⁶*Pierce v. American Communication & MacKay Radio*, 280 F. 2d 278, 1st Cir. (1960), *Pierce v. Allen B. DuMont Laboratories, Inc.*, 297 F. 2d 323, 3rd Cir. (1962) cert. denied Oct. 9, 1962, *Pierce v. Aeronautical Communications Equipment, Inc.*, 307 F. 2d 790, 5th Cir. (1962), cert. denied 371 U.S. 954 (Justice Douglas dissenting), rehearing denied 372 U.S. 925.

4. Whether the havoc wreaked among thousands of mineral lease applicants by a split-decision of the Court of Appeals for the District of Columbia¹⁷, permitting the Secretary of the Interior to ignore his own admittedly mandatory regulations to divest an oil-lease applicant of his rights under the Mineral Leasing Statute, was of sufficient importance for the consideration of the Supreme Court, particularly where, within a one-month period of this decision, three different panels of the Court of Appeals for the District of Columbia in parallel cases differed, also by split decisions in each case, as to whether to follow or to decline to follow this decision.

Other lawyers could easily supplement and complement these illustrations with even more deserving and far-reaching questions – but questions that apparently are of no concern to some Supreme Court justices.

What can be done about it?

8.2 A Few Measures Already Proposed

There have been proposals to lighten the burden of the Supreme Court and the complete federal judiciary by eliminating certain kinds of cases of federal jurisdiction, to wit, those based solely upon diversity of citizenship. It appears that this has had the support of some of the courts and some members of Congress¹⁸. But it has evoked serious objection by those who believe that it is vitally necessary for the federal courts to exercise such jurisdiction¹⁹. Though a compromise in the raising of the jurisdictional sum from \$3,000 to \$10,000 was adopted, our troubles still persist.

Justice Harlan has proposed increasing the number of law clerks. Certainly this should be done in any event – but not to substitute the views of law clerks for those of the justices as to whether or not a case should be heard, or as to the decision to be rendered. Others have suggested that administrative assistants of commissioners be given to the court, or experienced lawyers be appointed to aid the justices in the pursuit of their tasks²⁰. These proposals, however, clearly cannot obviate the real difficulties before recounted, as pointed out by the late Justice Jackson²¹.

Still other suggestions for an enlarged court and for sitting in sections of chambers have been found wanting²².

¹⁷*McKenna v. Seaton*, 259 F. 2d 780, certiorari denied, 358 U.S. 835 (1958). The gravity of the question involved was described by dissenting Judge Prettyman (p. 786). “The basic problem is the ‘rule of law.’ We have laws – either statutes or rules legally adopted – and we are supposed to be governed by them. If our governors merely do whatever strikes them as just and fair and reasonable at the moment, we have rule by men instead of by law. These are no clichés. Rule by law alone is the precise essential which differentiates our system from the totalitarian system. ... Not law but the will of the Secretary will then govern.”

¹⁸Justice Frankfurter in *Burford v. Sun Oil Co.*, 319 U.S. 315, 348; and Senator Norris, Senate Report No. 691, 71st Congress, 2d Session (1930).

¹⁹Donald S. Cohan and Mercer D. Tate, “Manufacturing Diversity Jurisdiction,” *Villanova Law Review*, Vol. 1, No. 2, pp. 201, 242 (1956).

²⁰Doris M. Yendes, 25 Univ. K. C. L. Rev. 178 (1956-57).

²¹Robert H. Jackson, *The Supreme Court in the American System of Government*, Harvard University Press, 1955, pp. 19 - 22.

²²Felix Frankfurter and James Landis, *The Business of the Supreme Court*, pp. 82 - 83,

8.3 A Different Proposal

An answer may lie in the lightening of the load of the Supreme Court, also providing a most desirable review of the decisions of the often conflicting panels of the various Circuit Courts of Appeals, by a newly created Intermediate Court or Courts of Appeals, sitting between the Circuit Courts of Appeals and the United States Supreme Court. This would enable the review of cases that presently should be heard by the Supreme Court but which that court just cannot handle physically or, because of personal interest or disinterest, is not disposed to handle²³.

Our society may presently be so complex, indeed, that individual judges of the Intermediate Court of Appeals, more knowledgeable in specialized fields, such as patents, unfair competition, taxes, copyrights, and the like, can guide the Court in those fields, but without the danger possibly inherent in making the trial court a tribunal of specialists or technicians. Such an Intermediate Court of Appeals with the Supreme Court as a tribunal above it, would not be disposed to foist its personal views upon the public or to decide cases on other than legal precedents and principles. Some measure of stability and uniformity in the law, moreover, could thus be introduced and many facets of our way of life, including property rights, no longer ignored.

This, moreover, would leave the Supreme Court free to hear mandatory appeals and the very occasional cases certified from, or through, such an Intermediate Court of Appeals. Perhaps, indeed, the mandatory field could be restricted or limited (as the court has done for itself by the “insubstantial federal question” doctrine) and all cases relegated to the realm of certiorari – somewhat as in the New York appellate practice. Special provision, in certain limited cases, for sidetracking the Intermediate Court of Appeals and proceeding directly to the Supreme Court might also be provided.

This proposal, it appears to me, might go a long way toward solving the difficulties before recounted, yielding a stabilizing single-court review, to which our citizenry is entitled and which the Constitution contemplated, but releasing the Supreme Court itself from all cases but those that it should be required to hear and *carefully* to consider and decide. The proposal could serve, moreover, to protect the court from most of the citizenship-diversity appeals that clutter its schedule, and as to which there has been great criticism.

Ancillary benefits from such an intermediate tribunal would inure in other cases of jurisdictional dispute between the Supreme Court justices, as in *Florida Lime and Avocado Growers, Inc. v. Jacobsen, et al.*²⁴, where the objection was raised by Justices Frankfurter and Douglas that the effect of the decision of a three-judge District Court enjoining a State statute on the grounds of its unconstitutionality not only serves to expand the Supreme Court’s

obligatory jurisdiction but contradicts the dominant principle of hav-

98 - 101 (1928); Hearings before the Senate Committee on the Judiciary on S. 1392, p. 1871, 75th Congress, 1st Session(1937).

²³Robert H. Rines, Unpublished Law Lecture, Detroit College of Law, November, 1959.

²⁴362 U.S. 73, 92, 93 (1960).

ing this Court review decisions only after they have gone through two judicial sieves.

So, also, might the disputes as to improvidently granted writs, as in *Needleman v. United States*²⁵, be at least partially obviated.

8.4 Conclusion

The time has come to consider positive action. Lawyers have heretofore historically protected our freedoms with their checks and balances. These are now in serious jeopardy from within. We of the present generation should not be found wanting in our interest and determination to find a prompt and workable remedy.

²⁵Certiorari granted 361 U.S. 808; dismissed (1960) as improvidently granted.

CHAPTER 9

A FORMULA FOR ECONOMIC DECLINE

While this book in some portions has covered a fairly large canvas, it has specifically dealt with the need to revamp the patent laws, or at least return their practice to the original intent of the founding fathers of the nation as stated in Article I of the Constitution. At this time, I would like to stress that this is but one small part of a much larger picture. In fact, if this picture were viewed as a work of *pointlisme*, that school of painting in which the whole is developed by the employment of thousands of small dots of color instead of brush strokes, patent reform would be but a single though arresting dot.

The larger picture is that after developing an industrial technology that can and has outproduced the world – after investing sixteen billion dollars annually in research – what this nation would seem to have acquired is a *sure-fire formula for economic decline*.

If there is any doubt that our creative industrial capability is standing still – and to stand still is to lose ground in modern technology – consider that for the third successive time in as many decades the automobile industry again appears as the only prime mover capable of pulling the country out of the economic doldrums. But this time it is increasingly evident that even that great industry, no matter how prodigious and brilliant its performance, cannot single-handedly absorb all the unemployed and lift the gross national product growth rate to the desired and necessary level.

While we have always considered ourselves as the most inventive of all modern nations – with the telephone, the combine harvester, the electric lamp, the mass-produced airplane and automobile as icons of this faith – the truth of the matter is that modification rather than innovation has become the accepted rule in American industry. Plastics, processed foods, outboard motors and synthetic textiles all appeared in the marketplace before World War II.

9.1 The Pity of Serendipity

Despite vast expenditures in research and the siren song of serendipity with its promise that our probings into space would result in unexpected discoveries, that they would unlock a cornucopia flow of new, amazing, and revolutioniz-

ing products that would change all prior concepts of living and accelerate the economy at a rate never envisioned before, nothing more remarkable than some cooking utensils can be traced directly to this mighty effort. And even here the manufacturer denies NASA's claim that these articles are a result of space research. The fact is that American technology has not developed a major product that every family has felt a compelling need to acquire since television.

Not only is private industrial research not paying off, but the expected spillover from the titanic technological expenditures of the government has yet to appear.

One of my friends, who has never been an alarmist, said that he didn't realize the trouble we are in until seeing the furor in print that greeted the advent of colored film for the Land Polaroid camera. "It certainly is a distinguished and creditable accomplishment, but the only thing 'awesome' about it is that *Newsweek* should use that word to describe it." He went on to say that nothing he had read had so disturbed him since Calvin Coolidge's 1928 pronouncement that the miniature golf boom of that year would prevent any recession or depression.

9.2 "Mind-Forged Manacles"

There has been some expressed concern. A member of the President's cabinet has admitted that "international competition is beginning to run rings around us. The nation's research effort is not producing the new consumer products, the new machines, the new industrial process that the country needs for a growing healthy economy."

Scientists in top management posts are not unduly alarmed. "There is an adequate base for pure research, but it has just not been applied," insists the director of long range planning for an industrial giant noted for its research depth. Other august opinions are: "We are not lacking in the capability to invent. Where we have trouble is in the incentive to invent." and "Increasing the economic rewards would give a real lift to U.S. inventiveness. . . . It's a matter of getting the risks and incentives into balance."

Unfortunately there is more to the matter than just getting risks and incentives into balance. If this were all, patent reform and recognition by the courts and government of the risks involved could probably restore the old incentives that in the first stages of the technological revolution enabled America to race ahead and provide a stream of goods on a scale never seen before. It was a time when Thomas A. Edison, "Tin-Lizzie" Henry Ford, Willie "Airbrake" Westinghouse, Alexander Graham Bell, Wilbur and Orville Wright were folk heroes and every other American youth dreamed of emulating them.

Today, not a single contemporary inventor is a household name, and most industry is so shackled with what William Blake termed "mind-forged manacles" that it is extremely doubtful that Edison, Ford, or Bell would be employed and, if employed, allowed to function successfully by the companies that now bear their names – for all three were nonconformists in terms of what are now firmly established industrial management rules and personnel selection procedures.

9.3 “Conformity Is a Psychotic State”

Applied to the present state of industrial and technological organization in these United States and the mounting challenges we face, there may be more truth than shock value in this diagnosis by playwright Clifford Odets. He insists rather violently that “this is the frontier that has to be opened. This is a new kind of Calvinism that allows no individualism. It is a frightening phenomenon and as rigid as any Calvin ever practiced.”

Whether this is a new kind of Calvinism and psychotic is certainly debatable, but that conformity is the enemy of innovation is not. And since conformity is the climate in most large business organizations, we may have paid far too high a price for some of our greatly revered achievements in mass production and management.

9.4 Mental Containers

According to office wits, nothing is more sacred to executives than a table-of-organization chart. This is probably true, for the head of the nation’s largest advertising agency seemed to realize that he was treading on dangerous ground when he said, “It never has been our idea that the organization structure should be complicated or an end in itself.” Organization charts can be impressive and yet have no meaning – in fact can be restrictive. Whether or not a large corporation or organization can function without charts to clarify the lines or executive responsibility has no bearing on creativity and inventive incentives – but the outlined rectangles that dangle down like earring ornaments in these paper pyramids do.

Probably the most effective mental container ever devised is the t.o. box – it lets little fresh thought in, and none out. If that is its main purpose, it is certainly successful. But if the encouragement of creative thinking and action is an objective of a firm or organization, then it is the greatest barrier Man has ever erected against himself. Every week more ideas are smashed, squashed, and ignored within four ruled sides than were suppressed by the Spanish Inquisition in the four centuries of that institution’s existence.

Former Olympic diving champion Fred V. Zendar, now a consultant in oceanic research for both government and private industry, recently made some rather penetrating comments on the subject of chains of command and lines of communication. He said, “In all big organizations there is a submerged layer that effectively blocks all communication from above and below. Oddly enough, sonar has detected a similar stratum of blocking water in the oceans, but here the level itself doesn’t remain stationary but periodically rises and sinks and sometimes parts.” He wryly added, “No such phenomena seem to occur in its human counterpart.” When asked what this layer is composed of, Zendar, who was a favorite fishing and flying companion of Ernest Hemingway and who doesn’t mind putting his shots below the waterline, replied, “In both cases, suspended silt. But I imagine if you examined it closely you’d find plankton and dead minute marine life in one; supervisors and paper-shufflers in the other.”

9.5 The Degree Slide Rule Won't Work This Time

Certainly if the aim is to reinvigorate creativity – and for industry and the nation to survive it must be – special attention must be paid to personnel procurement processes.

In educational circles there is already a wide divergence of opinion regarding college admission and aptitude test interpretations. Two University of Chicago psychologists hold that a high IQ is not a reliable sign of “giftedness” and may simply indicate mental grey-flannelism. In one series of experiments they found that 30 veritable Quiz Kids with IQs of about 150 showed few creative abilities, while an equal number in a much lower bracket were exceptionally good at putting facts into exciting new forms.

At Cambridge University in England, physical science students were found to be less intellectually flexible than art specialists and more restricted emotionally. It was found also that the ability to deal logically with facts and the ability to see new ways of doing things do not necessarily go together.

Of course, to a patent attorney, this is neither new nor surprising. The roll call of great inventors reveals that the initial “breakthrough” discoveries were often the brain children of men singularly lacking in expert knowledge in the fields that they ultimately revolutionized. Or as Sir Henry Bessemer, inventor of the steel-making process that bears his name, put it, “I had no fixed ideas derived from long established practice to control and bias my mind.”

All of this indicates that if the genes of inventiveness are to be sought and recognized, current yardsticks and measuring rules will have to be discarded. This will, or course, call for re-education of the sternest sort and a complete re-orientation of management thinking. Up to now the employment interviewer and personnel procurement manager have been able to play it safe by operating within a few time-tested guidelines tailored to the safe customs, folkways, and beliefs of this organization. Some of these shibboleths are unbelievable until one accepts the fact that every corporation is really a self-contained subculture.

Here are a few gathered at random: a S.B. will fit one job . . . another rates a Sc.M. . . but a Sc.D. would be overqualified. . . Anyone holding both a S.B. and LL.B. is apt to prove argumentative with his superiors. So far quite basic and undoubtedly time-tested. But listen to these: a man who has worked three different places in less than five years is either unstable or a “drifter.” . . . rockhunters are dependable. . . drivers of low gas consuming compact cars are seldom absentees. . . sports car addicts are just the opposite, but often make good application engineers. . . skiers usually write good proposals.

How to press home the hard fact that the supposedly unstable man made three changes because he found the tasks assigned boring and offering no challenge to his talents, or that one “drifter” is apt to prove more creative than fifty handbook engineers or benchwarming drones is something that I would like to call to the attention of the various schools of business administration and see what they come up with.

9.6 A New Use for Senior Scientific Statesmen

That many established ways of doing things are held in place not by logic or even by habit but by the enormous restraining force of vested interests is acknowledged by all who have studied the problem. And in many cases, the “vested interests” of employees, particularly at the supervisory level, have been found to be as strong as those of top executives, if not stronger.

For this reason instead of launching a direct attack on the deadly rigidity which stifles innovation and inventiveness in many organizations, or even attempting to eradicate the choking underbrush of custom and precedent which smothers originality, a new approach to the situation has been proposed and, in the case of one government department, has been given a trial run. This new approach calls for the creation of a new profession which will function outside regular channels of administrative responsibility and lines of authority, will be capable of gaining and maintaining the confidence of all employees, will be able to intimidate supervisory retaliation, and will at all times have access to and the respect of top management.

This calls for a large order in a man. But fortunately there are ready and available a number of men of this stature. These men are our senior scientific statesmen who have passed the age of compulsory retirement in corporations (many of which they headed) and have reached emeritus standing in our great technical educational institutions. Among their ranks are some of our most renowned inventors, respected educators, experienced administrators, and original thinkers in almost every scientific discipline. In the opinion of the Board of Governors of The Academy of Applied Science, these men represent a national resource which in our present predicament it would be treason to leave immobile. It may be added that The Academy of Applied Science is compiling a roster and setting up an activity that will make this great national resource available to the country.

9.7 Create or Perish

While the particular problems I have enumerated in this summary would seem to be the particular province of management, boards of directors, stockholders, and possibly the investing public, such is not the case. Creativity and any obstacles to it that exist or are put in its path are the concern of every person in the United States, and apply to every section of society and every field of endeavor. The conquest of disease can be seriously delayed, the most promising inquires into the nature and control of illness, the rate of new drug discovery which will enable us to score an ultimate victory over heart disease, cancer, and mental illness, are all jeopardized when incentives for research are not given ample recognition, but instead are objects for demagogic political attack.

We have all rather facetiously referred to the disappearance of the buggy-whip manufacturers, but how many of us realize that the flight engineering craft, which promised such a roseate future to hundreds of thousands of people, has had a life span of but fifteen years – from the coming in of the multi-engine propeller plane to its replacement by the jet. That in another year only two

of our great plane makers will be making planes and that the nation has just about decided to sit out the next round – supersonic carriers.

Vexing unemployment will become more and more a civic problem as whole communities and even states are dealt broadside blows by the increasing tempo of skill obsolescence. The answer is not as one government spokesman has said that the American craftsman should not seek permanence in residence and the schooling of his children but should be prepared to migrate like the birds to wherever new work opportunities peculiar to his skills arise – but that industry, government, finance, and the people themselves should go all out to reinvigorate the creative gift that from the varied nature of our people and our environment is our birthright and for nearly two centuries was the identifying mark of our genius.

Certainly it will call for an overhaul of our educational processes, a reassessment of many facets of our technology, and a recognition on the part of the scientific community that “the statesmanship of science requires that science be concerned with more than science.” But nothing less will do, for time is running out.

During the ninety momentous days of the Cuban crisis, we heard a great deal about “military options” and there were said to be arguments in the highest quarters that the Cuban missile threat was a diversion and that the real Soviet goal was the seizure of Berlin.

Let there be no argument of misconception about Soviet basic aims. *The armed threat of total thermonuclear war is the diversion – the Soviet goal is to take over the world by economic and industrial domination.*

Here there are no options. For America and the free world there is only one course of action –

CREATE OR PERISH

INDEX

- A T & T, 78–80, 97
Academy of Applied Science, 40, 102, 113, 118, 133
Air Brake, 33, 106
Airplane, 129
Alexander Graham Bell, viii, 43–47, 49, 50, 52–54, 57–60, 95, 105, 130
Alexander McLean Nicolson, 74, 75, 77–79, 81
American Bar Association, 103
American Bell Telephone Company, 47–49, 60
American Fruit Growers, 26
American Institute of Electrical Engineers, 96
American Speaking and Telephone Company, 48
American Telephone and Telegraph Company, 74, 77, 99
American Telephone Company, 58
Antitrust, 18, 20
Apple Tube, 98
Armed Services Procurement Regulations, 67
Atomic Energy Act, 6, 11
Atomic Energy Act of 1946, 68
Atomic Energy Commission (AEC), 6, 67–69
Atomic Energy Commissions (AEC), 100
Attorney General, 48
Automobile, 129
Autotransformers, 91
Ball-Point Pen, 96
Barbed Wire, 37, 106
Bell Telephone Cases, viii, 22, 24, 43, 49, 50
Benvenuto Cellini, 59, 60, 87, 90, 105
Bessemer Process, 132
Board of Appeals, 12–15, 27, 78, 91, 115
Board of Patent Interferences, 13
Bourseul, 54, 60
British Patent Office, 3
Brogdex Company, 26
Bureau of Standards, 64, 65
Cady v. Nicolson, 74
Calvin Coolidge, 130
Calvinism, 131
Cambridge University, England, 132
Carter Company, 70
Case of Monopolies, 4
Casper Ooms, 95
Caveat, 43, 44, 49
CBS-Hytron, 98
Charles F. Kettering, 34
Charles Pinckney, 6
Chesterfield Cigarettes, 71
Chromium Plating, 96
Chromotron, 98
Circuit Court, 48
Clay Commercial Telephone Company, 50
Clifford Odets, 131
Colgate Company, 70
Collar, 39
Computers, 112
Conditions of Patentability, 27
 First Inventor, 31
 Foreign Patents, 30, 31
 New and Useful, 27

- Prior Patent or Publication, 27
Prior Patents, 31
Public Use, 29, 30
Time, 28, 29
Congress, viii, 6, 7, 11, 12, 14, 15, 17, 18, 23–28, 30, 33, 34, 38, 40, 41, 82, 85, 86, 93, 94, 98, 101, 104–106, 116, 117, 122–125, 136
Congress, 23
Constitution, 6, 7, 11, 15, 17, 21, 23, 26, 40, 93, 98, 103, 104, 106, 115, 123, 124, 126, 129
Constitutional Convention, 5, 6
Conway P. Coe, 39
Copyright, 7, 18
Cotton Gin, 33
Court of Appeals, 15–17, 21, 22, 26, 36, 88, 93, 105, 106
Court of Customs and Patent Appeals, 15, 16, 36, 78
Courts of Appeals, 124–126
Intermediate, 126
Cyclotron, 96
Daniel Drawbaugh, 51, 57, 58
Denver Research Institute, 68
Department of Agriculture, 68
Department of Commerce, 8, 68
Department of Defense, 67
Department of Health, Education and Welfare, 68
Department of the Interior, 8, 16, 68
Department of the Treasury, 40
District Court, 15–17, 19–21, 24, 89, 91, 92, 106
Divisional Applications, 77
Dr. F. W. Kranz, 78
Dr. Philip Drinker, 65
Dubilier Condenser Corporation, 64
Dunning, 95
Dupont, 95
Dutch Patent Office, 89, 91
East India Trading Company, 3
Edgerton, 95
Edison v. Berliner, 49
Edmund Randolph, 7
Edward D'Arcy, 4, 5
Edward L. Bowles, 58, 78, 80
Eibel Process, 37
Einstein, 95
Electric Lamp, 33, 129
Electron Microscope, 82, 96
Elisha Gray, 48, 49, 51
Elkins et al v. United States, 123
Emil Berliner, 48
Emilio Q. Daddario, 100
Ernest Hemingway, 131
Ether, 25, 26
European Economic Community, ix, 30, 109
European Patent Office, 110–112
Federal Communications Commission, 16
Federal Reporter, 21, 22
Federal Supplement, 21, 22
Federalist Papers, 7
Fermi, 95
Florida Lime and Avocado Growers, Inc. v. Jacobsen, et al., 126
Ford, 95, 130
Fred V. Zendar, 131
Gardner Greene Hubbard, 44, 45
General Electric (GE), 69–71, 96, 98
General Electric Company, 24
General Radio Co. v. Watson, 91
General Services Administration, 67
George E. Frost, 96
George Washington, 7
George Washington Pierce, 79, 81, 99
Pierce Oscillator, 79, 81
German Patent Office, 89
Germany, 29
Goodyear, 95
Gordon McKay, 58
Government Contracts, viii, 65, 66, 97
Great Britain, 27, 29, 89, 106
H. D. Arnold, 74

- Harvard University, 65, 67
 Harvester, 129
 Helicopter, 96
 Henry Knox, 7
 Henry M. Hart, 121, 122
 Holland, 89, 91
 House of Lords, 91
 Hudson's Bay Company, 3

 I T & T, 81
 IBM, 97
 Infringe, 2, 4, 16, 19–21, 25, 26, 29, 30, 35, 38, 46, 49, 50, 53, 54, 70, 80, 82, 89, 99, 102, 106, 111, 112, 117
 Verbal Infringement, 80
 Interference, 31, 32, 48, 78
 Conception, 32
 Corroboration, 32
 Reduction to Practice, 32
 Internal Review Code, 40
 International Telephone and Telegraph Company, 71
 International Telephone and Telegraph Company, 81

 James Madison, 6, 7
 Jet Engine, 96
 John Jewkes, 96
 John P. Frank, 103
 John Ruggles, 8
 Joseph Jenkes, 6
 Judge Learned Hand, 34, 39, 60, 93, 94, 122
 Judge Morris, 92
 Judge Thurman Arnold, 93
 Judge Wyzanski, 82
 Jungerson, 59, 60, 105
 Jungerson v. Ostby and Barton Co., 59
 Justice Black, 38, 39, 103
 Justice Brennan, 103
 Justice Douglas, 39, 103, 126
 Justice Frankfurter, 60
 Justice Frankfurter, 126
 Justice Goldberg, 103
 Justice Harlan, 104, 125
 Justice Jackson, 60, 87, 90, 125
 Justice Marshall, 6
 Justice Roberts, 122
 Justice Waite, 58
 Justice Warren, 103

 Kline v. Creative Textiles Inc., 87

 License, viii, 19, 20, 41, 61, 63, 64, 66–68, 70, 71, 74, 80, 81, 100, 101, 105, 116–118
 Light Bulb, 105

 Magna Carta, 3, 4
 Mahnich v. Southern S.S. Co., 122
 Mallory, 34
 Massachusetts Institute of Technology (MIT), 58, 66, 67, 113
 Mineral Leasing Statute, 125
 Molecular Telephone Company, 50
 Monopoly, 7
 monopoly, 24

 National Aeronautics and Space Act of 1958, 67–69
 National Aeronautics and Space Administration (NASA), 67–69, 113, 130
 National Patent Planning Commission, 34
 Needleman v. United States, 127
 Nobel Prize, 118

 O'Reilly v. Morse, 51
 Office of Scientific Research and Development, 85
 Official Gazette, 18, 19
 Overland Telephone Company, 50

 Patent Act
 Patent Act of 1836, 8
 Patent Act of 1952, viii, 16, 18, 23, 25, 27, 33, 38–40, 95, 105, 116, 124

- Patent Office, 7, 8, 11, 12, 14–21, 27, 34, 38, 44, 45, 47–49, 59, 85–92, 109, 112–115
- Paul Langevin, 72, 74, 78–80
- Penicillin, 96
- People’s Telephone Company, 50, 57
- Philco Company, 98
- Philip Reis, 51, 55, 57, 59
- Photoflash Lamp, 96
- Pierce v. American Communications Company, Inc., 74, 77–80
- Pierce v. International Telephone and Telegraph Corporation, 81
- Piezoelectric Circuit, viii, 61, 71
- Polaroid, 34, 94, 95, 130
- Post Office Department, 67
- Power Steering, 96
- Procter and Gamble, 19
- Professor Dolbear, 50, 51, 53
- Public Health Service, 63
- Quick-Freezing, 96
- Radio Corporation of America (RCA), 69–71, 77, 97, 98
- Ray-O-Vac, 37
- Reaper, 33
- Refrigerator, 96
- Reissue Patents, 72
- Research and Marketing Act, 67
- Research Corporation of New York City, 66
- Rios v. United States, 123
- Robert C. Watson, 97
- Russia, 14
- Rutherford, 95
- Samuel F. B. Morse, 51
- Samuel Winslow, 5
- Senate Committee on the Judiciary, 34
 Subcommittee on Patents, 85
- Senate Judiciary Committee, 96
- Senate Subcommittee on Patents, Trade-
 marks, and Copyrights, 93
- Senator O’Mahoney, 93
- Sewing Machine, 33
- Shop Right, 63, 64
- Singer, 95
- Slide Fastener, 96
- Space Act, 11
- State Department, 8
- Statute of Frauds, 61
- Statute of Monopolies (1623), 5
- Streptomycin, 96
- Subject Invention, 65, 66
- Supreme Court, viii, 15, 21–26, 29, 33, 35–39, 43, 49–52, 54, 55, 57–60, 62, 63, 87, 90, 95, 99, 103–106, 114, 121–126
- Supreme Court of Indiana, 71
- Surgeon General, 68
- Sweden, 89
- Synthetic Light Polarizer, 96
- Telegraph, 33, 44, 45, 51, 54
telegraph, 45
- Telephone, 33, 45, 47–50, 54, 57–60, 129
- Tesla Coil, 106
- Thiokol, 34
- Thomas A. Watson, 44, 47
- Thomas Edison, 48, 49, 51, 95, 99, 105, 130
- Thomas Jefferson, 7
- Trademark, 12, 14, 15, 18, 19
- Triode, 95
- United Shoe Machinery Corporation, 58
- United States Patent Quarterly, 22
- United States Reports, 22
- Universal Copyright Convention, 30
- Vannevar Bush, 85–87, 90
- Veterans’ Administration, 67
- Wabash Appliance Company, 96
- Walter G. Cady, 71, 72, 74, 77–79, 99
- Watch, 96
- West Germany, 89, 90
- West Germany Patent Office, 115
- Western Electric Company, 71, 74, 78–80

Western Union Company, 44, 45, 47–
50

Westinghouse, 95, 96, 105

Willie Westinghouse, 130

Wright Brothers, 95, 130