

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.

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 taken 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 Judiciary [1].

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.

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 witnesses, 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 century [3] 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 case [4] 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 prong 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 fiction [5].

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 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 consider 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 overlooked [6].

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.

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

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

Opositions 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?

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 "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.

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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 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

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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 re-search program was conducted."

The rare interdisciplinary man, however, who combines judicial temperament with a scientific background can not only preserve rights in the manner 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 a 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

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(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.

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:

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

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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 1939 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 patents 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, 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 cases [12]. 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

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Former Patent Commissioner Casper Ooms points out [13]:

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 "breakthrough," 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.

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.

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The Future of American Patents

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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.

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 attorneys 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 inventions 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 7.1 | 2 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 AT&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. 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 laws, had previously been stimulated to develop the art. What if, however, he had not struck out on his own?

What Is Wrong?

But what faces the professor, other individual inventors and small businessmen today? They face the "passion" mentioned

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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 be 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 epoch-maker in the world of science and commerce, there will be pirates who spring up on all sides and contest his rights to his ideas [20].

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 to 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 years [21].

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.

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 court [22].

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 of 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. Long [23] 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 contractee [24], 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. Daddario [25], on the other hand, would settle for a compulsory royalty-free nonexclusive license to the government. The late President Kennedy's recent directive [26] still appears to leave the government agencies to their own devices within certain prescribed ground rules, including prompt use of inventions by companies 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?

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 fore.

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 inventor 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.

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 offices of many patent lawyers are new ideas for further development that are not being actively exploited? Or that the investor today is wary of sinking money into the inventor's wild idea? Where is return? Where is his protection?

Is it 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 purposes [30]?

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 along [31]. (Italics mine.)

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 patents [32]."

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 recognized [33].

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, Jr., that the function of the Supreme Court is to act as the "national schoolmaster" 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 to 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.

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 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 advance 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 writings 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],

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 by Nikola Tesla [39]; and to many other inventions which have helped companies to start up so to build the America we have heretofore known [40].

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 1950-1962, 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 whole society

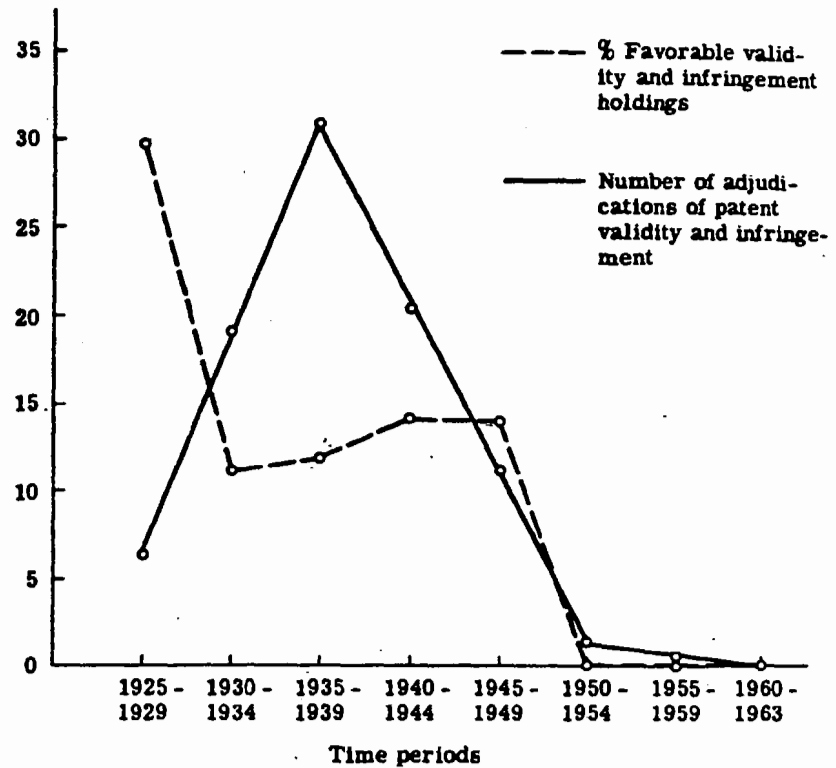


Figure 9. A measure of the interest of the United States Supreme Court in patents.

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.

Footnotes

1. Senate 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.
2. Ibid.
3. In the Jungerson case. See above, p. 65.
4. Kline v. Creative Textiles Inc., 146 F. Supp. 65.
5. 236 F. 2d 713 (1958).
6. Helm v. Lake Shore, 107 U.S.P.Q. 313.
7. Senate 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 technical details.
8. 188 F. Supp. 879 (1960).
9. Senate Subcommittee on Patents, Trademarks and Copyrights, Study 1.
10. Ibid., p. 266.
11. Senate Subcommittee on Patents, Trademarks and Copyrights, Study 3, 86th Congress, 2d Session (1961).
12. Since 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).
14. Senate Subcommittee on Patents, Trademarks and Copyrights, Study 2, p. 18, 84th Congress, 2d Session (1957).
15. John Jewkes, The Sources of Invention, Macmillan, 1959, p. 50.
16. S. W. Herwald, "Economics and Incentive Plans," report of panel discussion, American Institute of Electrical Engineers, Feb. 1-6, 1959. Unpublished.
17. Frank A. Howard, "The Lagging Pace of U.S. Invention," Product Engineering, July 18, 1960, p. 75.
18. Samuel W. Bryant, "The Patent Mess," Fortune, Sept., 1962, pp. 111-113, 226, 231-232.
19. See above, fn. 13.

20. Remisen Crawford, "Patents, Profits and Pirates—An Interview With Thomas A. Edison," Saturday Evening Post, September 27, 1930, p. 3.
21. Ibid.
22. See above, fn. 18.
23. Russell 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).
24. John 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."
25. See above, fn. 23.
26. October 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.
27. Senate Bill S1290, 1963, 88th Congress, 1st Session.
28. Reed C. Lawlor, "The Public Interest: Government Patent Policy and Equity," 47 American Bar Association Journal 972 (Oct. 1961).
29. "Ingenuity: A Quality of Victory," The Technology Review, Vol. 64, No. 8, pp. 35, 36 (June, 1962).
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.
34. Reported in Time, August 23, 1963, p. 17.
35. Fred Rodell, Nine Men, Random House, 1955.
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).
38. 143 U.S. 275.
39. Westinghouse Electric & Mfg. Co. v. New England Granite Co. et al., 103 F. 951, affirmed 110 F. 753.
40. An 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).