Left: A corner of the Patent Office, showing how thousands upon thousands of documents are filed away for reference purposes. Right: An examiner's room in the Patent Office. It is interesting to note that in 1836 the Patent Office became an independent bureau, headed by a commissioner, assisted by one examiner and six other subordinate clerks and employees

Two glimpses inside the United States Patent Office

Seventy-Five Years of American Patent Administration

How the System Has Developed from Small Beginnings, and What It Means to the Nation's Industry

By William I. Wyman

SEVENTY-FIVE years ago the leading industrial country was England. It was in that country that the Industrial Revolution began, due to a series of remarkable inventions of the most fundamental character which originated at about the time of the American Revolution. The inventions by Britishers of the spinning jenny, power loom, reverberatory puddling furnace and steam-engine—all perfected within half a generation—led immediately to the greatest of all changes in civilized history.

The Industrial Revolution and Human Nature

The Industrial Revolution did everything but change human nature. It radically altered politics and history, and did a great deal to modify the appearance of old Mother Earth herself. England, the scene of this revolution, was its first beneficiary, and three-quarters of a century ago its predominance in industry, commerce and wealth was uncontested. The United States was just feeling its way then in manufacturing and machine production. But in the infancy of its industrial life this country presented a radically new system of patent procedure and protection, which tended powerfully to stimulate ingenuity and advance the United States to the foremost place in invention and manufacture. England originated the patent system, her inventions which caused the Industrial Revolution gave strength and body to the system and in turn made it the occasion for the development of the new era. The United States act of 1836, devised by Senator John Ruggles of Maine, constituting the so-called American method of granting patents, was the first vital departure from English patent laws. This act instituted the present organization of the United States Patent Office nine years before the founding of the SCIENTIFIC AMERICAN and in that short time demonstrated its virtues and possibilities.

The law it superseded and the prevailing procedure in all other industrial countries were based upon the "registration" system of granting patents without scrutiny of operativeness, examination of novelty or demonstration of invention. Except as it was made more effective by minor changes, the act of 1836 remains in larger outlines in the law of today; and except for alterations which shall more effectively carry out its purpose and principles, it will persist in the systems of the future. While the

law did not fulfil the complete hopes of its creators, it was a pronounced step in the right direction and a decided jump in advance not only of anything that had previously existed, but that had ever been proposed. It was constructive legislation in the highest sense of that abused term. It provided an organization and a mode of procedure for which there were no precedents and presented a positive and clear cut plan for determining patent rights which was absolutely logical and complete and which in its larger outlines provided for every possible contingency. It sharply accentuated the advantages of a proper "examination" system by its vivid contrast with the signal failures of the previously existent "registration" regime. So marked was its success, so closely related to the progress of American industry, so intimately identified with and provocative of the genius of invention, that the so-called American method of granting patents became the standard practice for the whole world to emulate or admire. The only notable exception to this trend, the only highly progressive and powerful state which adheres in entirety to the old "registration" system, is France. And while there may be no necessary connection between her industrial position and her patent system, it is a fact that she has lost relatively in recent years in the international race for economic precedence. And this in spite of the fact that no people are more ingenious, more original in conception or bolder in action. Even staid, conservative England has compromised and accepted partially the advantages of the examination system. The first country to be industrialized, the first to feel the impulse due to invention, the country to whom the greatest fundamental inventions of modern times are due, England had every reason to remain content with her centuries-old patent system. But she was being passed in the

race by the newer industrial nations and she was compelled to alter her system in accordance with the methods which were conferring ascendancy upon her competitors.

Property in Ideas

For the first time in all history the means for ascertaining and decreeing rights of property in ideas and promoting the objects of a system of patent protection was placed on an intelligent, scientific and adequate basis. Before this time, it was true that some measure of examination prior to the grant was indulged in. In Massachusetts and Connecticut, long before the Revolutionary War, patents were granted by the legislative bodies after a conference with the inventor and a scrutiny of the invention, while under the act of 1790 the Federal Government did the best it could to ascertain utility and the state of the art, but the efforts in these various directions to give valid basis for the patent were spasmodic and fragmentary. No facilities, organization or body of adequate law was ever provided before this time properly to initiate and carry on the "examination" system. This act provided a means for collecting the art, a personnel sufficiently trained to examine the same intelligently, and the machinery and procedure for scientifically endeavoring to give effect to the purpose of the law. That purpose was to throw on the Office the burden which the courts had alone performed, to determine the utility, novelty and patentability of the invention when and where the patent is granted, and, as one writer puts it, "To eliminate litigation 'before it begins.'"

The law of 1836 provided a dignified procedure, gave the grant a *prima facie* standing of validity, and if it did not start this country on its unprecedented industrial era, was at least the most powerful agent

in stimulating inventive genius and conserving its fruits. Industrial civilization and invention are inseparable factors. One cannot be comprehended without the other. The present law may be defective and the means to administer it may be inadequate, but the fundamental principles upon which it is based are sound. It only needs that it be improved in such detail as necessity indicates to make it the effective instrument that Senator Ruggles perceived it to be for the promotion of the comforts, well-being and progress of a civilized state.

The Patent Office Building, the erection of which was begun in 1836 and finished in 1840. This original structure forms the F Street wing of the present building

The first commissioner of patents and the man who inaugurated the system under the act of 1836 was Henry L. Ellsworth. During his administration the vulcanization of rubber and the electric telegraph were invented and patented. In the short nine years preceding the 75-year era under discussion such a stimulus was given inventions by the new act as to excite the utmost admiration and wonderment of the Commissioner as he was about to retire from office. In the birth-year of the *SCIENTIFIC AMERICAN*, the second Commissioner of Patents, Edmund Burke, assumed office, so that the life of this publication is almost coextensive with that of the modern patent system.

A great deal of the early reports of the Commissioners was devoted to presenting agricultural statistics and information interesting to tillers of the soil. By law, the Commissioner of Patents was charged with this duty. Since that time, this activity became vested in a separate bureau and later in a department, while the office to which it was originally an appendage is still an obscure subsidiary to an organism to which it has no functional relationship.

The Rush of Patent Business

Even in the earliest days of the history of the office, the condition which has since become chronic, manifested itself. In one of his reports, Commissioner Burke complains: "The office is seven or eight months in arrears of its business and is daily becoming more and more embarrassed. Thus, I have in five separate communications to Congress and its appropriate committees within the last two years made full expositions of the embarrassed condition of this office growing out of its greatly increased and increasing business and the inadequacy of its force to perform its duties."

The fact is that the business presented to the Patent Office has always run ahead of its facilities of performance. Public opinion has failed to recognize the stimulating effect upon invention produced by the patent system and the excessive demands made in turn upon the office by the production of such stimulus. There has been a constant lag between the necessity of giving the office support and the furnishing of the required assistance.

In 1851, in the annual report of the Commissioner, were published the beginnings of the present Rules of Practice. In that year, also, the reviews of the advances in the arts by the examiners were omitted in the annual reports. These reviews were comprehensive summaries of the inventions patented during the year and were attempts to appraise and analyze the different contributions of the patentees. They indicated much labor and enthusiasm and gave testimony to the extreme regard the examiners must have taken in their pursuits and the wide scope of their interests.

In the year 1852 there were filed 2639 applications for patents. Commissioner Hodges commenting upon this showing said: "Some find it difficult to conceive that this flood of discoveries and improvements is still to maintain its progress. They look for a falling off and doubt whether there is room for the continued exercise of inventive genius. Every step taken, instead of bringing us nearer to the close of our career, does but open new scenes to explore and prepare the way for new triumphs." It was good prophecy, based upon a thorough consideration of fundamental factors, but even this bold seer would have hardly dared to imagine an income of applications thirty times as large in the course of less than three generations.

In 1861, act of March 2, considerable changes in the organization of the Patent Office were effected. A permanent board of examiners in chief was created to hear appeals taken from the decisions of the primary examiners; the present filing fees were established; and the term of the patent grant was extended to seventeen years. Commissioner Holloway, who served during the Civil War, made the pregnant observation in one of his annual reports that the introduction of labor-saving devices through the exer-

Comparative volume of patents granted by various countries, shown by the relative sizes of the flags, up till the time of the world war

cise of invention was the means whereby a million men could be released from industry without a reduction of output. His successor, Commissioner Theaker, speaks in the same tenor when he remarks: "The ingenuity of inventors has attempted, by mechanical means, to so control and operate the various machines with which our country abounds, that they have to a very great extent supplied the places of the persons who were made victims of war."

Immediately after the Civil War, the business of the office increased by leaps and bounds. It was a period also of questionable practices and moral lapses in both politics and business, and the Patent Office fell under the spell of prevailing influences. In 1869 Colonel Samuel S. Fisher was appointed, through the recommendation of the Secretary of the Interior Cox, Commissioner of Patents. Colonel Fisher inherited a condition arising from maladministration and rapid growth of the business of the office. He was Commissioner for but one and one-half years, and, although his administration was one of the shortest, it was by far the most fruitful of accomplishment in the history of the office.

Before he entered the Patent Office, chaos had descended upon its administration; its procedure was unscientific, unstable and hopelessly involved; its conclusions uncertain and disturbing; while its functions generally were performed inefficiently and with exasperating dilatoriness. Charges were openly made of favoritism in its conduct, while the public could not free itself of suspicions of dishonesty attaching to its methods.

A Critical Period

He first addressed himself to the task of improving the personnel of the examining corps. As the so-called "American System" of granting patents is based upon a consideration of the prior art, it is evident that its efficiency is dependent upon the character and qualifications of the men who make the examination. This aspect is the vital factor in the whole theory. Commissioner Fisher sensed its importance at once, and proceeded to introduce a system of selecting appointees which was based solely upon the fitness of the candidates for the designated position. As he stated in his Annual Report for 1869, referring to the qualifications of examiners, "It becomes very important, therefore, to secure competent men for positions of such responsibility. An examiner should be a man of great patience, industry and honesty, of varied and yet thorough mechanical and scientific attainments, with a good knowledge of patent law, and a mind capable of the nicest discrimination. Though many men offer themselves for the position, but few are fit to fill it."

The tests he constituted were probably the first ever established for entrance into the Civil Service that were rigid, searching and competitive in character. They comprised all the elements of the modern merit system and anticipated its general introduction by almost a generation. It was only through the opposition of a public-spirited official now and then who chanced to be in power and who dared to interpose that the logical result did not intervene and disrupt the whole administration of government. One such official was Gov. J. D. Cox, Secretary of the Interior, who had induced Colonel Fisher to accept the Commissionership. The latter knew only too well how important to the industrial interests it was that the work of the office should be conducted by men of technical and scientific capacity and of high character. And in his efforts to provide a personnel of the desired attainments, he was supported without qualification by his immediate superior.

The result of Commissioner Fisher's policy was shown in the character of the new members of the corps, who in all the requirements of the position readily demonstrated a superiority over those in office who had come in under the old order. Secretary of the Interior Cox, who was a powerful barrier to the progress of many a corrupt influence and who was most anxious to improve the methods of government administration, gave his testimony of the effect of the new policy in the Patent Office in the following words: "No one could become even superficially acquainted with the organization of that important bureau without seeing that a spirit of emulation and zeal had taken the place of a listless and negligent performance of duty." In reviewing the history of those days, one cannot but help noting how far we have advanced in the ethics of government administration. Those who are despairing of the capabilities and rectitude of the office-holding class have no basis for their pessimism. On the contrary, there is good ground for optimism. A most casual comparison of conditions then and now shows an immense improvement in the personnel, both in efficiency and honesty, and a decidedly more wholesome atmosphere.

Commissioner Fisher and Secretary Cox were mostly responsible for initiating this movement, which led to such important results in improving the standards of public taste and executive

(Continued on page 364)

Chart showing a plot for applications for U. S. patents and for patents granted since 1865. Upper curve represents applications for patents and re-issues, and lower one represents patents granted excluding re-issues. Dotted lines represent what might be called the lines of normal increase

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Fig. 604

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pearance of the all-metal machine in peaceful pursuits. It was during the last year of the war that German, introduced all-metal airplanes over the battlefields of France, and those Junker monoplanes were erroneously looked upon as mere freaks not worth even copying for experimental purposes. As a result the German aircraft constructors have scored a distinct scoop, to use the parlance of the newspaperman, on the world at large. Since the war the Germans have adapted their Junker monoplane to commercial work, and as such they have a most excellent six- or eight-passenger machine which has scored many enviable records. The metal airplane, which marks a new era in airplane construction, was predicted in the SCIENTIFIC AMERICAN as early as 1910, together with the retractable chassis, gyroscopic stabilizer, and other features now realized in present machines.

Seventy-five Years of American Patent Administration

(Continued from page 341)

efficiency. It is appropriate that the Patent Office should have been the scene of this innovation, for nowhere else in the Government service is the character of the personnel such a vital factor in the value of its proceedings. If Commissioner Fisher demonstrated nothing else than the efficiency and morality of the merit system, his administration would have been among the most notable. And yet this was but one of several similarly vital reforms he introduced.

Congressional Recognition

Frequently, an executive's hands are tied by the law. Do all he can, turn as he will, progress may be denied him owing to conditions imposed by statute. Having done all within a man's power to improve the administration of the office, but recognizing the legal limitations that barred proper development, Commissioner Fisher next attempted to overcome the inertia of the law-making body. New legislation was absolutely essential for carrying into effect his ideas as gained from his experiences, and he did not hesitate to ask for everything that he deemed necessary for that purpose.

In the first place, Mr. Fisher proposed legislation which led to the publication of the *Official Gazette* and the photolithographing of copies of patents. He was also instrumental in placing on the statute book, with the powerful aid of Representative Jenckes, the consolidated patent act of 1870. This act codified the law and, in addition, presented new features tending in the direction of modernization.

The patent act of 1870 not only introduced several broadly new features but codified the laws relating to patents, and the office is now running substantially on the basis of that act. The most important innovation since that time was the creation in 1883 of the International Bureau for the Protection of Industrial Property, by which the residents of every subsidiary country have reciprocal rights in all the other countries in regard to applying for patents and the procedure connected therewith in the respective patent offices.

The Patent Office and the Courts

Another change of momentous influence was the modification of the jurisdiction of the United States Supreme Court. Up to 1891, the highest court of the land assumed appellate jurisdiction in patent causes. Since that time, except in highly specialized instances, the courts of last resort in patent litigation are the nine separate circuit courts of appeal. There has resulted from this change, made necessary to relieve the docket of the United States Supreme Court, a confusion of principles, an uncertainty in patent rights and an inconsistency between the frequently inharmonious views of the different but equally important jurisdictions.

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But the greatest loss has been in the absence of those great decisions formerly handed down from the Supreme Court bench.

The patent system established by the act of 1836, creating the so-called "American" or "examination" method of granting patents by which scientifically and legally trained men scrutinized the technical merits of the invention, compared it with all known like efforts by an examination of every available printed record, and determined the form and legal limitations of the grant, has been pronounced to be the greatest piece of constructive legislation ever placed on our statute books. Certainly, no law designed for purely national aims has ever been copied so extensively as this. Almost every nation which has any pretension to being influenced by modern industrial tendencies, has adopted it or adapted it to its own purposes. This law thrust upon the Patent Office a substantial portion of the legal work that had hitherto devolved upon the courts. It was a radical departure from all existing systems, which merely provided for the "registration" of the application when deposited in the Patent Office, and gave the patent neither legal nor industrial value.

Under the registration system, patents were granted to others than the inventors, or for inventions that were old or inoperative. This system was tried out for 33 years previous to 1836, and created such uncertainty in the patent situation, opened the door to so many frauds, and was productive of so much unnecessary litigation, that it became more of a menace to industry than a help, and depressed the spirit of invention rather than stimulated it. England, as already stated, discarded this system.

Germany and Japan, the two countries above all others in recent times which have had their eyes open to the main chance, have copied the American or "examination" patent system. No other nations ever made such conscious, deliberate and studied attempts to achieve material success, and they went to every other country to learn what it most had to offer, and did not hesitate to borrow and adopt from it what they found most of value.

Our Patent Growth

America is the land of ingenuity, and the national genius finds its outlet in invention. As far back as 1857, the applications filed in the U. S. Patent Office exceeded those filed in England by one-third, and since the founding of this government, almost as many patents were granted in the United States as in England, France and Germany combined. The measure of the activity, however, of the Patent Office is indicated by the applications filed, and not by the patents granted. It is curious to observe in this respect how the history of the great war repeats the experience of the Civil War. The heaviest year in applications filed preceding the latter event was in 1860. In 1861 occurred a decided dropping off, succeeded by gradual gains in the following years. In 1864, with the end of the war in sight, a marked increase took place, while in the three succeeding years the business jumped by leaps and bounds.

So in the more recent event—the year 1916 saw the largest business ever presented to the office up to that time. Our entrance into the war did not make itself felt until several months later, but in 1918 its full effect was shown in a 15 per cent drop in receipts from the average of the seven preceding years. Before the year 1919 got well under way, the effect of the cessation of hostilities became apparent, and by summer the receipts began to exceed those of the heaviest of preceding years.

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