

INVENTION

Century of Science Progress Reviewed for Celebration

Patent System Is Now an Even Century Old; Before That Patents Were Granted by President and Cabinet

FROM files of the U. S. Patent Office a swift-moving panorama of the nation's progress in industry and agriculture—as marked by the basic patents it has issued to inventive genius—is emerging in review for the past century.

The National Committee for the Celebration of the American Patent System on Nov. 23 in Washington points out that before 1836, patents were issued to individuals only by vote of the President's Cabinet and required the signatures of the President of the United States and the Secretary of State.

When John Quincy Adams affixed his signature to a patent for John Moon's "new and useful improvement in his machine for shelling corn" in 1825 or to Chester Stone's washing machine in 1827 he probably had as little foresight of the rising trend of

invention leading up to applications for television inventions a hundred years hence as the average individual has today of developments to come 100, 50, or even 5 years from now. These will certainly include practical television; possibly wireless transmission of power, glass paints for art portraits, a revolutionized farm industry in which one acre will produce the equivalent of 50 today, synthetic motor fuels, and a host of other fascinating possibilities already on the horizon.

When the United States was primarily an agricultural country the thoughts of inventors naturally turned to machines which would increase production and lower labor costs. Thus in 1794, 18 years after the Revolutionary War, Eli Whitney received a patent for his cotton gin and laid the foundation for the South's basic agriculture for a hundred years to come.

What Whitney did for the South another southerner, Cyrus H. McCormick, a Virginian, did for northern and western farmers who found grain their most profitable crop. In 1834 McCormick received a patent on his first crude grain reaper, upon which all subsequent harvesters up to the present giant power combines of midwestern prairies have been built.

Twelve years before McCormick, however, another inventor, T. Howe obtained a basic patent on a horse-driven "thrashing machine" which promised to rid man of the laborious task of flailing his grain and separating the chaff from the grain by throwing it up into the wind. The two machines today are combined in the present machine which cuts, threshes, separates, weighs and sacks the grain production of millions of American acres.

"Telegraph Signs"

In 1840 Samuel F. B. Morse patented his "telegraph signs." Old patents also reveal that Alexander Graham Bell was a telegrapher before he invented the telephone, having patented in 1876 an apparatus for transmitting "two or more telegraphic signals simultaneously" on a single wire by instruments which set up "a succession of electrical impulses differing in rate from the others." Following him came Emile Berliner of Boston for a patent on a "microphone or contact-telephone" and Francis Blake of Weston, Mass., who patented in 1881 a "speaking telephone." In 1892 appeared a patent granted to Thomas A. Edison for a "speaking telegraph" and in the same year the dial telephone system was conceived in a patent granted Almon B. Strowger of Chicago for an automatic telephone exchange.

Marconi Experiments

Wireless telegraphy came into being with the experiments of Marconi at the turn of the century and in 1906 Henry H. C. Dunwoody of Washington patented such a system. By 1914, E. H. Armstrong of Yonkers, N. Y., received a patent for a wireless receiving system and three years later Carl R. Englund of New Jersey patented an apparatus for "radiotelephony." In 1906 Lee de Forrest of New York City obtained a patent on the heart of radio, the vacuum tube.

When electric lighting was just around the corner in 1879, C. F. Brush of Cleveland, O., patented his carbon arc lamp and a year later the versatile Thomas A. Edison patented the incandescent electric lamp. In 1888 Nikola



HOME OF PATENT OFFICE

Taken from the top of the Washington Monument, this view shows the U. S. Department of Commerce Building which houses the Patent Office and, at the right, other new government buildings.

Tesla of New York City had patented a device for the "electrical transmission of power." In 1907 J. A. Heany of York, Pa., received a patent on the hair-filament tungsten wire for such lamps and in 1912 Peter Cooper Hewitt of New York City conceived and patented the mercury vapor lamp to simulate daylight in artificial lighting.

The motion picture industry was born back in 1893 when Thomas Alva Edison patented his "apparatus for exhibiting photographs of moving objects" which is basically the movie camera of today, and in 1897 added the "kinetographic camera" for making the photographs to be exhibited.

Sound pictures were conceived much later when the phonograph and motion pictures were combined, but in 1878 Edison patented his first phonograph or "speaking machine" with its wax cylinders for recording sound.

Today's streamlined automobile was the "road engine" patented by G. B. Selden of Rochester, N. Y., in 1895 which proposed the use of an early Diesel, or compression-ignition, engine for power and was to stop with a hand-operated brakeshoe on the rear metal tires. The patent on the machine was later revoked after it was declared impractical by the courts. In 1903 Clyde J. Coleman of New York City patented a device which included a "starting motor" for the motor vehicle and applied the power to the rear instead of the front wheels.

Vulcanized Rubber

The birth of the rubber tire, tending to make riding easier, came back in 1844 when Charles Goodyear of New Haven, Conn., patented the process of preparing vulcanized rubber from caoutchouc, or India rubber.

When the automobile industry was thus in its infancy two Ohio boys, Wilbur and Orville Wright, were perfecting in their Dayton bicycle shop the first successful heavier-than-air flying machine, which they patented on May 22, 1906. Nine years later Glenn H. Curtiss patented a similar machine and in 1919 another milestone in aeronautics history, the patenting of the trademark "Liberty" for the famous aircraft engine of that day, was recorded.

The World War, which stimulated the perfection of the Liberty engine, obscured the patenting in 1918 of one of aviation's greatest aids, the gyroscopic compass, by Elmer A. Sperry. Later inventions based on the gyroscopic principle have culminated in the automatic gyro pilot, first tested thoroughly by

the late Wiley Post in his solo round-the-world flight, which will fly a plane automatically until the gas runs out and then land it on an even keel if no trees and hills are in the way.

Aluminum is one of the commonest metals used today, finding uses ranging from airplane and automobile parts to artificial bones for the human body. But until 1889, when the youthful Charles M. Hall of Oberlin, O., patented his electrolytic process for extracting it, aluminum was used primarily in expensive jewelry and for other aristocratic applications, such as the helmet which Napoleon III wore with considerable pride.

Plastics in 1870

The era of plastics, the tough, hard, non-burning substitutes for wood and metal which can be molded readily from a semi-liquid state, had its beginning in 1870 when John and Isaiah Hyatt of Albany, N. Y., patented a method for treating and molding pyroxyline. Thirty-nine years later Leo H. Baekeland, known as the father of the plastic industry because of his discovery of Bakelite, obtained two patents on methods of creating the new products.

Modern newspapers, with their frequent editions, fast market and sport reports, and split-second presentation of the news, owe their hold on the public to Samuel F. B. Morse and his telegraph; to Ottmar Mergenthaler of Baltimore who patented his first linotype, or machine which speeded up the setting of type; to Henry A. Wise Wood of New York City who patented in 1903 his machine for making printing a continuous process by casting type on cylinders; and to F. E. Ives of Philadelphia who patented in 1893 a process for making half-tone pictures.

Implements of war have been a favorite field of American inventors. An early patent on a "sub-marine vessel" was granted to L. D. Phillips of inland Michigan City, Ind., in 1852 and other patents on similar vessels were issued leading up to the "submarine locomotive" of Simon Lake in 1896 and the submarine boat of John P. Holland of Newark, N. J., in 1902.

The single-shot, muzzle-loading pistol gave way in 1836 to Samuel Colt's "revolving gun" and the machine-gun was born in 1862 when R. J. Gatling of Indianapolis, Ind., patented his famous six-barrel, rapid-fire cannon which came into its own during the Spanish-American war.

Rapid transportation by train and bus

RADIO

November 24, 5:15 p.m., E.S.T.
LIGNIN—ENIGMA OF THE FOREST
—Carlile P. Winslow, Director of the
U. S. Forest Products Laboratory.

Dec. 1, 5:15 p.m., E.S.T.
AMERICAN FURS—Frank Ashbrook of
the U. S. Bureau of Biological Survey.

In the Science Service series of radio discussions led by Watson Davis, Director, over the Columbia Broadcasting System.

would be impossible today without the swift-acting, dependable air brakes which were perfected by George Westinghouse Jr., of Schenectady, N. Y., in 1869. Nine years before, however, Nehemiah Hodge of North Adams, Mass., received a basic patent on an air brake and in 1879 was granted a patent on vacuum railroad brakes.

The cash register came into being in 1883, patented by James Ritty and John Birch of Dayton, O.; the typewriter was patented in 1868 by C. Latham Sholes, Carlos Glidden and Samuel W. Soule of Milwaukee, Wis.; the vacuum sweeper was patented by Ives W. McGaffey of Chicago in 1869; Eli H. Janney of Alexandria, Va., patented a successful appliance for coupling railroad cars in 1873; and Elias Howe, Jr., of Cambridge, Mass., patented his first sewing machine in 1846.

Patent Number One

Just 100 years ago, in original Patent No. 1, Senator John Ruggles of Maine patented cog gears, which he called "traction wheels"; the barbed wire fence was patented by Joseph F. Glidden of DeKalb, Ill., in 1874; the first electric flatiron was patented by Henry W. Seely of New York City in 1882; electric welding came into being with the patent granted Elihu Thomson of Lynn, Mass., in 1886; the player piano arrived with a patent granted William B. Fleming of Detroit, Mich., in 1889; and King C. Gillette of Brookline, Mass., patented his safety razor in 1904.

These were the inventors who during the past 100 years ushered in the modern miracles of steel, electricity, radio, plastics, air and land transportation through their experiments with wires, rods, wheels, gears, exploding gases and electrical impulses, often struggling against the objections and opposition of their families, friends and business associates until eventual success brought acclaim and in some instances adequate monetary rewards.

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