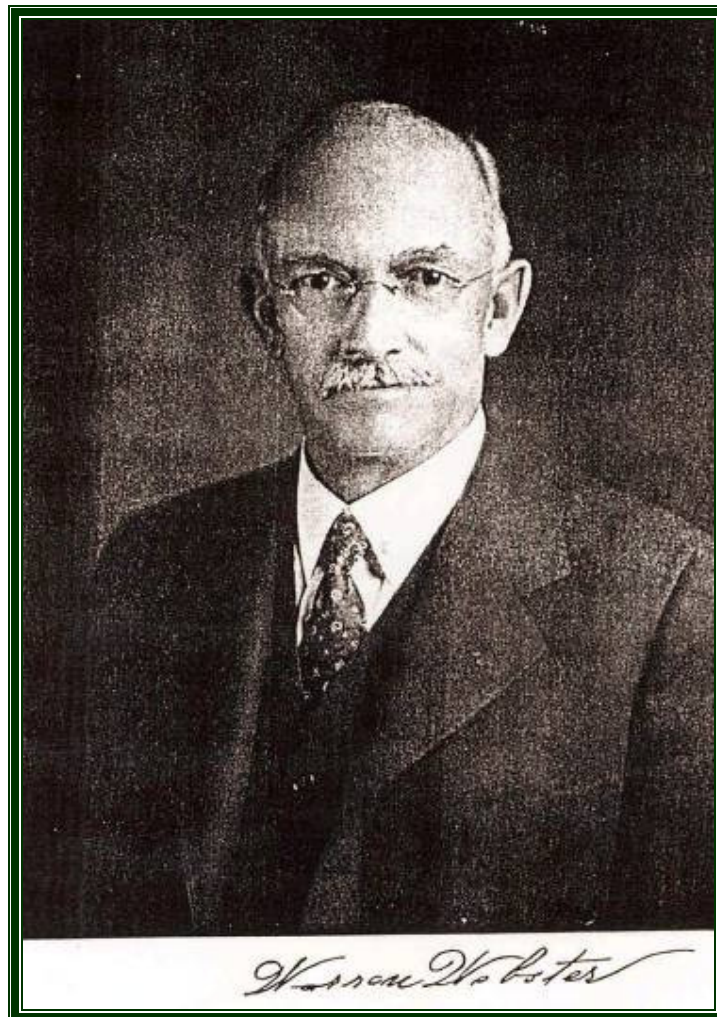




WARREN WEBSTER
1863-1938



Pioneer of Vacuum Steam Heating

[47] Warren WEBSTER

1863-1938

American engineer. Pioneer in vacuum steam heating. The first developments were due to DeBeaumont (USP: 1878) and Williames (USP: 1882). Webster first purchased (1888) an interest in the vacuum steam heating patent of George Barnard. His firm, the Warren Webster Co., shortly thereafter acquired the first patents of DeBeaumont and Williames, becoming the principal manufacturer of vacuum return systems for many years. System operation was considerably enhanced by the thermostatic return trap of Willis Hall (USP: 1891). (A competing system, designed by William Skiffington in New York, was developed by Andrew G. Paul, who sold the rights to Andrew Cryer (1898). Cryer established the Paul System Co., which equipped many hundreds of buildings with the system.)

(Mini-biography from "The Comfort Makers," Brian Roberts, ASHRAE, 2000)



Warren Webster (2nd from left) Manager of Star Ventilating, Philadelphia, c.1889

High Spots in the Progress of Vacuum and Vapor Heating

ANY account of the development of vacuum heating must start with the work of the pioneers, who bore the heat and burden of the day in making it a commercial success. This success did not come over night.

Prominent in the list of brave souls, who backed the new method with all they had, was Andrew G. Paul, whose death, in 1915, ended a spectacular career during which he made a fortune only to lose it.

The story is still told of how, in 1890, William Skiffington, then in the employ of the Fairbanks Company, on Broadway, New York, invented vacuum return-line heating. His work bench was at the back of the store, where the glass roof sloped toward the rear wall. Skiffington was required to report for duty before steam heat was generated in sufficient quantities to warm his shop, so he conceived the idea that if he could draw the air out of his coil and create a partial vacuum within the coil, the first steam generated would flow to his shop.

There was a Jenkins air valve with a carbon post to the coil in his shop, to which he attached a $\frac{1}{4}$ -in. pipe and ran the same to the basement and connected it to the boiler-feed pump. By this means he eliminated the air from the coil and created a partial vacuum within the coil; consequently the first steam would flow to his shop.

A day or two later, Andrew G. Paul, the company manager, walked into Skiffington's shop and noticed that it was comfortably warm; while his own office was cold. He asked, "How is it your shop is always warm before the rest of the building has the chill taken off?" When Skiffington explained how he had accom-



Warren Webster
An Early Pioneer in the Field of Vacuum
and Vapor Heating

plished his desire for heat, Paul exclaimed, "Why, man, you have made an invention."

And so he had. His invention marked the beginning of vacuum return-line steam heating. While the patents taken out were in his name, Andrew G. Paul was the guiding spirit in its commercial application. He managed to raise \$50,000, and organized the New England Vacuum Heating Company in Boston, which, later, became the New England Paul System Company.

But it was one thing to invent a system and another to put it over in a commercial way. After losing most of his capital, Mr. Paul, in 1898, sold out the rights in the Skiffington and Paul patents for the New York district to Albert A. Cryer, who had been associated with Mr. Paul in his experimental work. Mr. Cryer made the Paul System the fashion, and equipped hundreds of buildings throughout the metropolitan district with the Paul system of heating.

At about the same time that Andrew G. Paul became active in the

vacuum heating field, Warren Webster, of Warren Webster & Company, Camden, N. J., acquired a patent on a vacuum heating system designed by George Barnard, of New York. In that system, the suction line was connected to the return end of the radiator, instead of to the air valve. It provided for by-passing the vacuum return-line through a heat exchanger of suitable type, cooling the returns and putting the heat thus given up to useful purposes.

Going farther back, however, the maintenance of a partial vacuum in the return line of a heating system produced by mechanical means is the outgrowth of two basic patents, one issued in 1878, to DeBeaumont, and the other in 1882, to Napoleon Willames. Both of these patents were acquired by Warren Webster & Company and are considered the basis for the development and commercial exploitation of that company's vacuum return-line system.

So strong, however, was the Paul or Skiffington patent, that Mr. Paul, during the life of his patent, was able to collect royalties on all installations of vacuum return-line heating. Eventually Warren Webster & Company purchased that patent also.

In the Chicago district, the Paul patent rights fell into the hands of C. F. Fowler, a former congressman from New Jersey, who, with his brother-in-law, James E. Heg, formed the Automatic Heating Company. Later the company's headquarters were moved to New York, but it continued to operate in the Middle West.

While originally the royalty charged by Andrew G. Paul was one cent per square foot of direct radiation, this figure had risen to ten cents a square foot at the time Warren Webster &

THE LIFE AND TIMES
OF
WARREN WEBSTER

by

WARREN WEBSTER, JR.

*The story of Warren Webster and His Company as told by his son, 1942
(CIBSE Heritage Group Collection)*



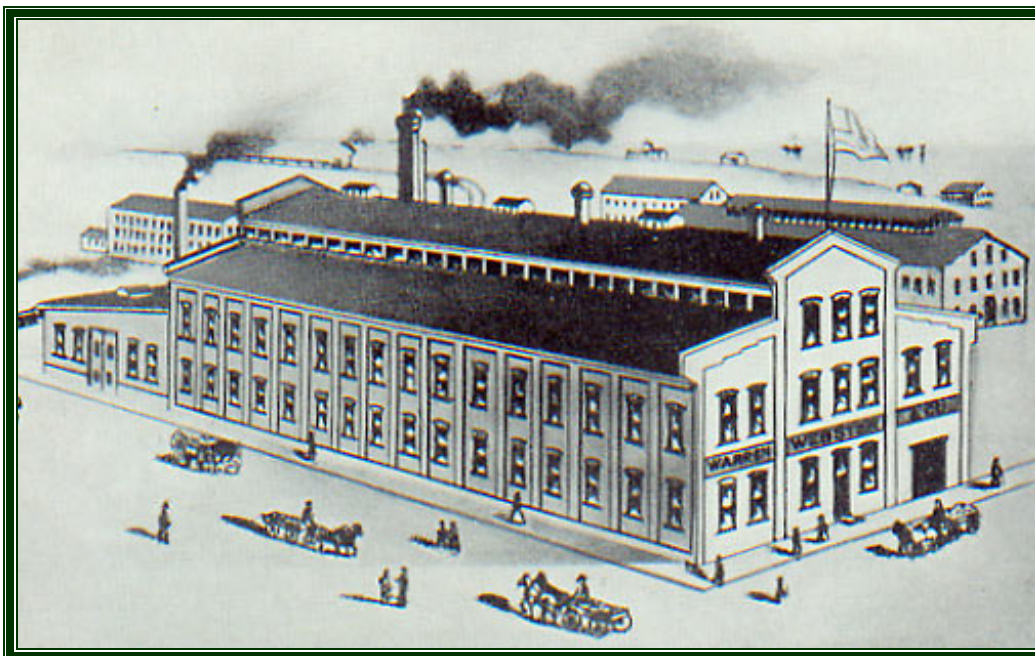
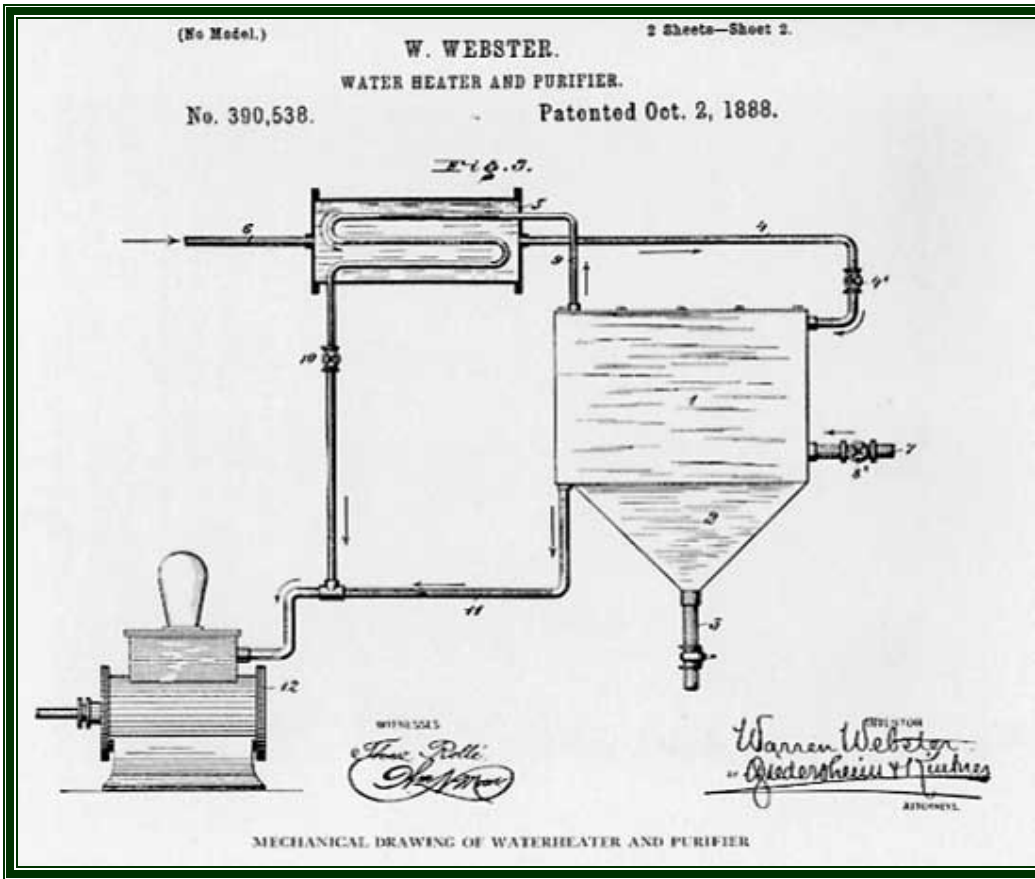
Warren Webster at the age of 5



Warren Webster in 1890, age 27




Wedding of Mr & Mrs Warren Webster, 2 July 1891



Warren Webster Factory in Camden, NJ, 1893



Company Conference, Philadelphia 1911



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WITHOUT BACK PRESSURE.

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Advertising blotter



The Warren Webster Factory in 1938



30th Anniversary Testimonial Dinner, Camden, NJ, 1938

Founder of Industry Observes 50th Year as Active President

Warren Webster at 75 Still Takes Keen Interest in Manufacture of Steam Heating Appliances; Got \$4 Weekly on First Job

By GORDON MACKAY

Sang James Russell Lowell many years ago: "What is so rare as a day in June"—and Warren Webster, president of Warren Webster and Company, a Camden industry known around the civilized globe, agrees heartily with the poet.

For it was in the month of brides, roses and graduates, some 50 years ago, a golden span in Warren Webster's life, when a spruce, alert and ambitious youth of 25 decided to found the firm that bears his name today.

While the start in Philadelphia was modest enough, Warren Webster became president of his own company. He has held that office ever since, a golden triumph in a business whose 50th anniversary is celebrated fittingly and rejoicingly by the firm and its employees.

Today at 75, Warren Webster is not content to rest on his laurels won, one of them being the reputation as "one of the greatest salesmen in America." He still takes a keen, personal interest in the vast industrial enterprise, of which he has been the only president for 50 years.

His sons, Warren Webster, Jr. and E. Kessler Webster, assume some of the cares of the industrial empire, which swings into every country on the face of the earth, where the natives like steam heating in the winter and have a building that requires the quality of Webster appliances.

The vast business which has grown under the able hand and deft management of Warren Webster is a big family. This is said in no maudlin, mawkish attempt at a compliment, but is the unvarnished truth, as a scrutiny of the employes' roster will well disclose.

One week before the thunder of Gettysburg's guns sounded the doom of Lee and the downfall of the Confederacy, Warren Webster was born in the Tioga section of Philadelphia. When the boy was six his family moved to Woodbury. It was there that Warren Webster went to school. Naturally the county seat of Gloucester county counts Warren Webster among her notable sons.

When Warren was 13 the Centennial Exposition was held in Philadelphia. The youngster naturally visited this centenary of the United States. One of the exhibits that Switzerland sent was a cottage, typical of the homes that nestle at the foot of the Alps.

At the close of the exposition some Philadelphian purchased the cottage brought from Switzerland and moved it to become the Philadelphian's Summer home at Ocean City. Thirty-two years ago Warren Webster bought that cottage he had envied as a boy, and now occupies the dwelling as his own Summer home.

Young Webster entered the Peirce Business College in Phila-

delphia to obtain a commercial training. He was graduated from that institution on April 23, 1881. Like countless of his successors today Warren looked around for a job. He spotted an advertisement in the newspaper, where an office boy could work for \$4 a week for the N. G. Taylor Company, whose business was at 303 Branch street, Philadelphia.

Young Webster got the job, started work copying letters, running errands, doing all the usual chores that fell to officeboys in those days. The nimble, agile mind of young Webster, a mentality harnessed to natural instinct for business, got him a jump of \$8 a week in his salary pronto.

For, the youngster was the chap who discovered a wrinkle whereby the firm could save considerable money, by adopting a system that young Mr. Webster suggested. Warren Webster didn't remain long at \$12 a week, either. The American Oxide Bronze Company, a commercial enterprise no longer extant, wanted this budding commercial genius.

This firm offered the young business prodigy \$15 a week to go on the road as a salesman. There was a 5 percent commission thrown in as extra inducement. It was this that drew young Webster to the bronze corporation. All the while that the young salesman was on the road, however, desire gnawed at his satisfaction, he wanted to be his own boss, to run his own plant.

Warren Webster had \$500 saved by this time, so he decided to take the plunge. Fifty-four years ago young Mr. Webster, then just entering his majority, also entered business, selling Babbitt metal, afterwards brass heads.

You just couldn't keep success away from the acquisitive fingers of Warren Webster. He balanced the books after a year in business, found he had paid everything and netted \$673 profits. Not enough to make him a plutocrat, but sufficient to prove to young Mr. Webster that he could make money as a business man.

Expansion was always a keynote of the Webster system. He went into ventilators and in 1888 obtained some patents for the use of steam exhaust for feedwater heaters. The first one operated successfully, the second manufactured came to Camden, and was installed in the plant of the Esterbrook Pen Company here.

Saving in coal for 30 days soon demonstrated the economy, value and service of this new gadget, and young Mr. Webster decided to concentrate on his new enterprise. He sold the ventilators which he held to Merchant and Evans, of Philadelphia, a firm which has also had a long career and life in industry.

The modest factory in Philadel-

phia proved too small for the expansion of this new industry. When vacuum heating came into vogue, and Webster became interested in this new manufacture, the business expanded so rapidly as to become a vast major enterprise. Forty-five years ago Webster sold his patent to a steam economizer and vacuum principle to Eugene Mauler, of Antwerp, Belgium.

The proceeds from this sale to the Belgian manufacturer were sufficient for young Webster to erect his own real plant. To the gain of this city, Webster built in Camden. His original plant in 1893 was at Point and Elm streets. Later the plant moved to Federal street where the tremendous industry is housed at the present time.

While exact figures are not at hand, the impression at the factory is that Warren Webster heating equipments have been placed in 75,000 buildings throughout the world. You can find them in a greenhouse in Massachusetts and a bank in Santiago, Chile.

They can be found in a school in New York, and the Royal York Hotel in Toronto, Canada, the largest hotel in all the vast British Empire.

Webster heating systems are in the Empire State Building in New York and the Chrysler Building in the Manhattan metropolis also. Westfield Acres, the Federal housing project in Camden, is heated by the Webster system, so is every building in the University of Notre Dame in South Bend, Ind.

The new Waldorf-Astoria in New York City has the system, and the magnificent Palmer House in Chicago, too. Quite a romantic tale exists about the installation of the system in the latter hostelry. Potter Palmer, who owned the Palmer House, which is shown in every moving picture that deals with Chicago in the swashbuckling days that apparently have gone forever, was one of the fathers of the Windy City.

The original Palmer House in Chicago was famed around the world when it was erected, back before the Civil War. Its rooms were heated by stoves, 700 of them to be exact. In 1895 the stoves were dismantled, Webster heat supplanted the old fat-bellied heaters of the earlier era. When the new hostelry supplanted the old, Webster's heating was installed in the new hotel.

Newspaper homes, such as the New York Post, are included among the Webster clients. The Statler, United, and American hotel chains, the latter including Camden's own Walt Whitman, use Webster heat. The great terminals in Chicago and Cleveland are heated by Webster, so is the Banco Central de Chile in Santiago.

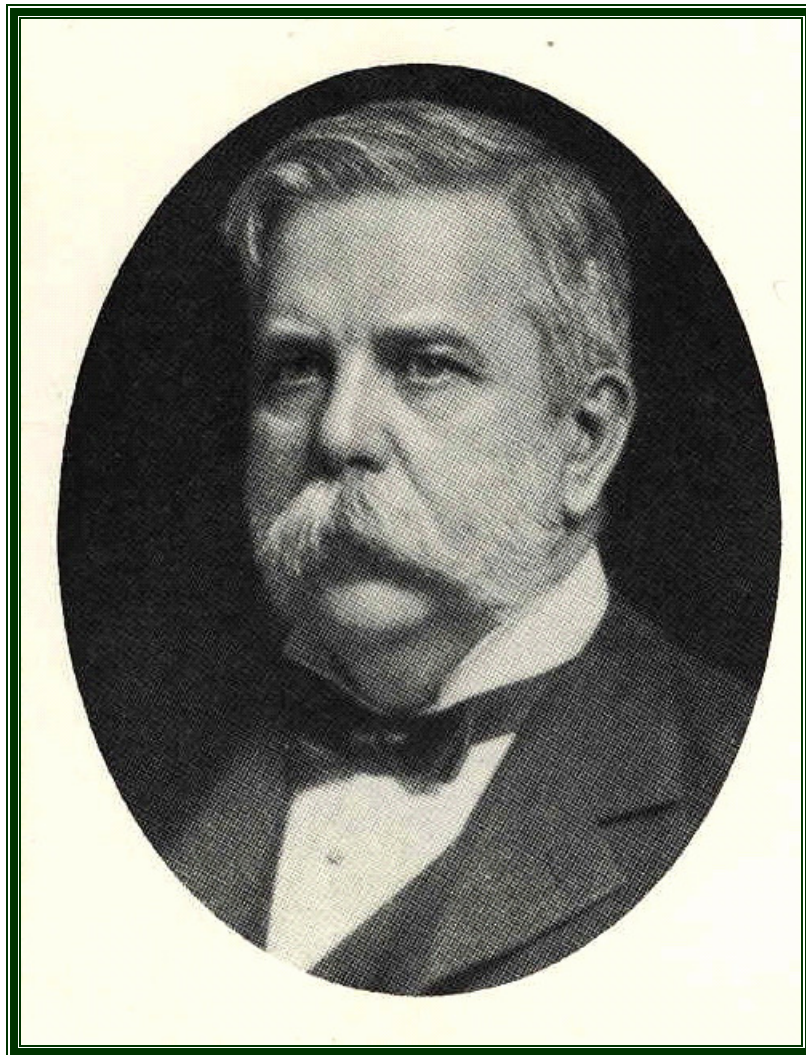
One of the spots where Webster heat warms its users is Coffeyville, Kansas, where the Missouri Pacific freight shed is included in the Webster "jobs." That spot should interest others than the industrially-inclined, for it is the birthplace of Walter Johnson, the great baseball pitcher. It also is the place where the notorious Dalton Boys, the bandit gang and bank robbers, tried their last bank-robbing job.

Coffeyville citizens, warned that the attempt would be made, armed themselves, waited in ambush for the bandits, opened fire upon the marauders. In the pitched battle that followed three or four bandits



GEORGE WESTINGHOUSE

1846-1914



Pioneer of Alternating Current Generation

George WESTINGHOUSE**1846-1914**

American engineer. Made his fortune with his invention (1868) of the railway compressed air brake. He foresaw the possibilities of alternating current, manufacturing equipment designed by Tesla [280] and purchased the Tesla patents for the ac electric motor. This brought him into direct conflict with Edison [279] who favoured direct current systems. The battle was won in favour of alternating current when Westinghouse secured the contract (1893) to develop the Niagara Falls power station.

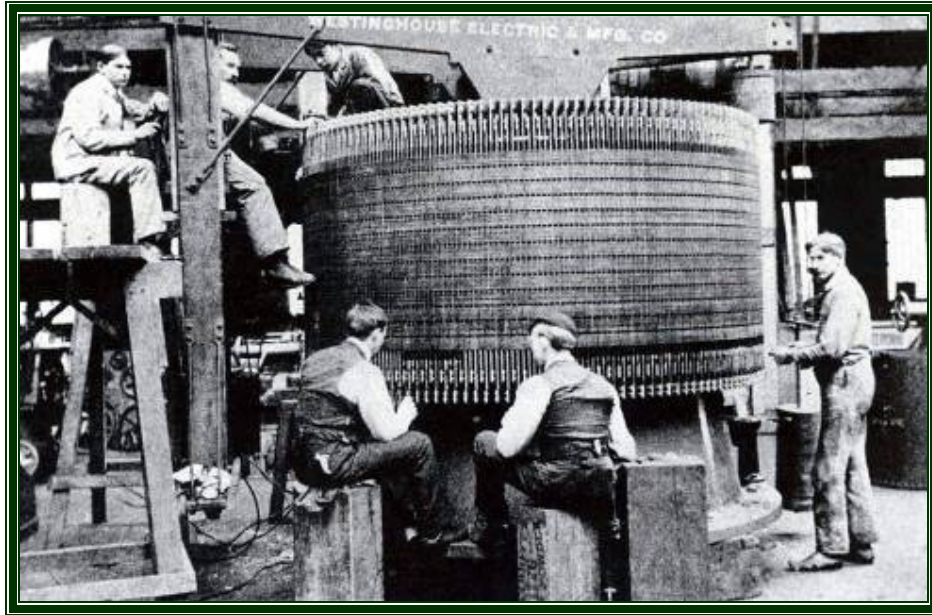
(Mini-biography from CIBSE Heritage Group Records)



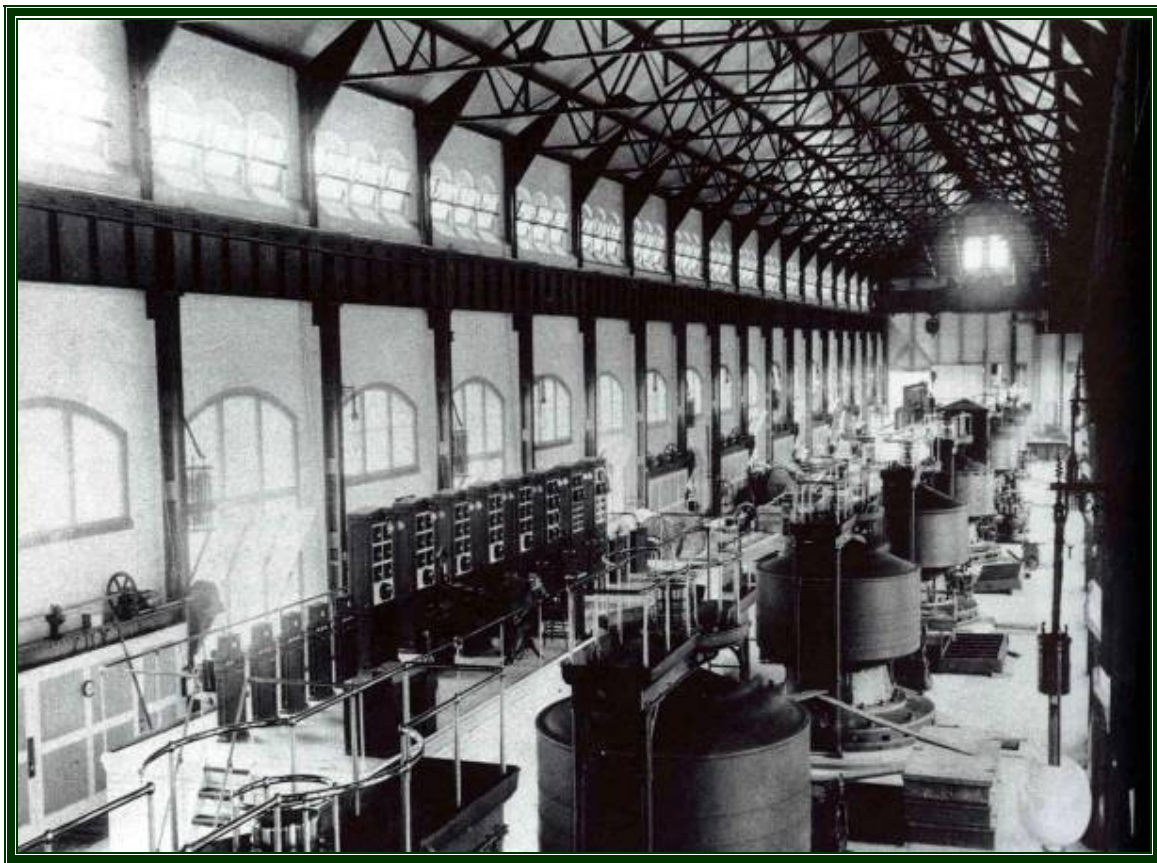
Blaine Mansion, Washington DC: Home of Westinghouse

George Westinghouse, just two years younger than Edison, was himself a prolific inventor-entrepreneur, acquiring more than 400 patents in his lifetime. He had built his reputation early with his invention of the air brake in 1869. But it was not until 1881 that Westinghouse became commercially involved with electricity. His understanding of the commercial potential of ac systems led him to push hard the developments that revolutionized the electric power and light industry. By 1891 his company—the Westinghouse Electric Company, formed in 1886—installed the nation's first single-phase power transmission system at Telluride, Colorado, the first polyphase system in Chicago in 1893, and then—at the turning point for the entire industry—much of the Niagara facility, completed in 1895.

(Text EPRI Journal, March 1979)i



A Niagara Falls Generator under construction at Westinghouse, Pittsburgh 1894



*Interior of Edward Dean Adams Power Station at Niagara Falls
With ten 3000 hp Tesla/Westinghouse AC generators*



The first Niagara Falls generators go on-line, 16 November 1896



*Lord Kelvin (centre) with George Westinghouse (left), August 1897
(Pictures from "Tesla: Master of Lightning," Margaret Cheney & Robert Uth, 1999)*

General Electric (Westinghouse) Turbine (12 MW) installed in the Commonwealth Fisk Street Station, Chicago, in 1909 (EPRI Journal, March 1979)



Westinghouse Memorial Tablet