WARREN WEBSTER
1863-1938

Pioneer of Vacuum Steam Heating
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 ¼-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 accomplished 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 1896, 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 Williams. 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 & Company purchased the rights to the Paul patents.

(From Heating & Ventilation magazine, June 1929)
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
Warren Webster Factory in Camden, NJ, 1893
Company Conference, Philadelphia 1911

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 June — and June is the curving, rose-purple, glassy, golden month — that Warren Webster was born. It is 25 years since the firm that bears his name today.

While the start in Philadelphia was modest, Warren Webster became president of his own company. He was 45 years old, and he had built up a business that now signals his 50th anniversary in commerce. He is president and treasurer of the firm he started.

Today, at 75, Warren Webster is not content to rest on his laurels, nor does he sit in the easy chair of leisure, as are many who have built up a business of any status. He is, in fact, busier than ever, thanks to the growing demand for his company's products.

Webster was born in Camden, and he has never left the city. He has built up a business that is now one of the largest in the world in the field of steam heating appliances.

The firm, which has been in business for 50 years, has grown under the able hand of management. Warren Webster, now a big company, is doing a big business, and he is happy with the results.

One week before the founder of the company's 50th anniversary, the company was named a charter member of the Camden Chamber of Commerce. Warren Webster was present, and he was enthusiastic about the company's future.

When Warren was 13 the Centennial Exposition was held in Philadelphia. The young man was very interested in the exposition, and he went to see it every day. He was interested in the steam heating appliances that were on display, and he decided that he wanted to make them.

Webster entered the police station in Philadelphia to obtain a commercial license. He was 21 years old, and he had just graduated from high school. He was determined to make his mark in the world of business.

The young man went to work for the company that was to become Warren Webster and Company. He worked hard, and he learned everything he could about the business. He was promoted to the position of assistant to the president, and he was given more responsibilities.

Webster became president of the company in 1920, and he has never looked back since. He has built up the company into one of the largest in the world, and he is very proud of his成就.

The company now employs over 500 people, and it has a plant in Camden that is one of the largest in the world. The company also has a plant in New York, and it exports its products to many countries around the world.

Webster is a man of great energy, and he never stops working. He is always looking for new ways to improve his products, and he is always thinking of ways to expand his business.

The company has won many awards for its products, and it has been recognized as one of the best in the industry. Webster is very proud of his company, and he is very happy with the results.

The company has made many contributions to the city of Camden, and it has been a leader in the field of steam heating appliances. Webster is very proud of his company, and he is very happy with the results.

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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)
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.
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