

OTTO C. WOLF: BREWERY ARCHITECT AND ENGINEER, PHILADELPHIA, PA

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Philadelphia began its evolution to become a world-class brewing center shortly after William Penn landed in Pennsylvania to stake out his 'Green Country Towne' in 1682. Penn invited tradesmen of all stripes to create a lively center of trade and commerce, and the first brewer set up shop just three years later. Eventually becoming the largest English speaking city outside of London, Philadelphia brewers shipped beer throughout the colonies and around the world. The introduction of lager beer yeast there in the 1840s spurred tremendous growth of the brewing industry, both in Philadelphia and throughout the country, as American Lager became a national beverage.

Otto C. Wolf was well positioned to become the city's premier brewery architect and engineer, having been born to one of its pioneer lager beer brewers in 1856. A beautiful lithograph in the collection of The Library Company of Philadelphia shows an image of the brewery that proclaims Engel & Wolf to be '*Die erste Lagerbier-Brauerei in Amerika*'. The caption goes on to describe five large vaults, 45 feet below ground and having a volume of over 50,000 cubic feet.¹ One can well imagine Otto as a lad marveling at the sights and sounds at his father's brewery, walking inside the extensive beer vaults carved out of the solid rock banks of the Schuylkill River, and experiencing the cool temperature they provided for ripening Engel & Wolf's celebrated lager beer.

Otto (Fig. 1) graduated with the University of Pennsylvania's first class in mechanical engineering in 1876, the same year that the Centennial Exhibition was held in Philadelphia. Inside Brewers' Hall was a working brew house and malting facility, set up along

with all the other machinery, equipment and products required by the trade. Not least among these were enormous refrigerating machines, which must have excited the imagination of this young engineer who grasped the



Figure 1. Otto C. Wolf, Class of 1876. Courtesy of the University of Pennsylvania Archives.

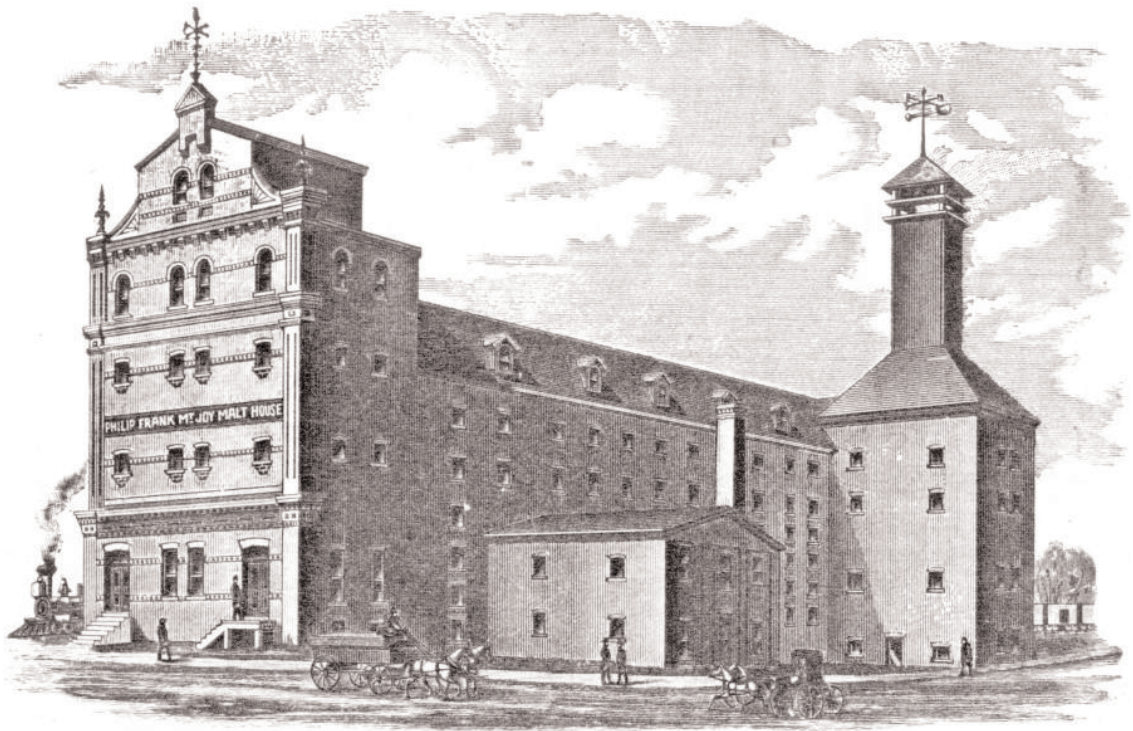


Figure 2. Philip Frank's malt house in Mount Joy, PA was destroyed by fire. In 1886 Wolf replaced it with a 250,000-bu. per year plant with storage capacity of 100,000 bu. It was equipped with Fred W. Wolf's patented malt kiln floors and a barley cleaning machine capable of processing 700 bu. per hour. *The Western Brewer*. XI, 11, November 1886, p.2636.

potential they held for revolutionizing the brewing industry. In fact, Wolf's projects demonstrate that he made refrigeration one of his specialties for brewers and other trades with similar requirements.

Wolf's first job was with the U.S. government as an engineer and draftsman for the Ordnance Department, which assigned him to draft foreign army and naval equipment on display at the Exhibition. He then apprenticed with a company that manufactured mining machinery and, while there, he designed a number of machines, including one for making coins which was adopted by the Japanese Government. In his later years, on a visit to Japan with members of the American Institute of Mining Engineers, Wolf was gratified to see his machines still in use.²


To further his experience, he went to work with a manufacturer of Corliss engines, power and machinery equipment. His older cousin, Fred W. Wolf, was a brew-

ery architect and engineer in Chicago, whose firm had the American rights to manufacture and distribute the German Linde ice and refrigerating machines. Otto spent three years in Chicago working for Fred W. Wolf as a supervising engineer, familiarizing himself with the science and technology of mechanical refrigeration and designing a number of cold storage plants in that city.³


In 1883 Otto C. Wolf returned to Philadelphia and established himself as a brewery architect and engineer. The comprehensive list of projects executed by his firm is impressive. Over the course of his career, from 1883 until his death in 1917, numerous articles appeared in *The Western Brewer* with detailed accounts of his work (Fig. 2). His ads also contained a growing list of clients and the work he did for them (Fig. 3). Most projects were concentrated on the east coast, but they eventually spanned the continent and beyond. His obituary in *The Western Brewer* in January of 1917 states that he com-

Otto C. Wolf,

Brewers and Maltsters'

ENGINEER 

AND

 **ARCHITECT**

Rooms 21 and 22,

419 WALNUT STREET,

PHILADELPHIA, PA.

Figure 3. Otto C. Wolf Ad. *The Western Brewer*. X, 11, November 1885, p.2314.

pleted 572 projects during a 30-year career; this writer has been able to identify 487 thus far.⁴

Wolf's first project was a fully-equipped 150,000-barrel beer and ale brewery for James Everard in New York City in 1883. Such a significant initial undertaking demonstrates the confidence placed in his firm by the trade. In the following three years, 45 projects were completed (Figs. 4-7), and by 1889 his firm had completed 120 (Figs. 8-9). The November 1889 issue of *The Western Brewer* contained this tally of his work in Pennsylvania alone:

A Proud Record. 200,000 bbl. brew house and fixtures, Louis Bergdoll; Robert Smith ale brewery, 50,000 bbl.; ale brewery of Bergner & Engel; 50,000 bbl. Germania Brewery, Philadelphia; Philip Frank's malt house, Mount Joy; Peter Barbey & Son, 50,000 bbl. brewery; Reading Brewing Co., 50,000 bbl. brewery; Lauer, brew house, etc., Reading; H. Straub & Co., brewery and outfit, Pittsburgh.⁵

This impressive list of breweries does not include other kinds of buildings, like the Opera House in Figure 10, or

projects for allied industries, such as the Philadelphia Warehousing and Cold Storage plant along the Delaware River in Philadelphia (Fig. 11), a huge facility that remains in use today. Nor does it include work for the Chesapeake Dry Dock & Construction Company in Newport News, Virginia, which covered a vast acreage on what had been a swamp. In addition to the shops, Wolf laid out an entire town there for the Old Dominion Land Improvement Company, including 143 three-story residences, an office, a bank, and a school.

The 1890s were busy years for Otto C. Wolf with 29 projects in both 1890 (Fig. 12) and 1891. The following year saw 55 works, including the erection of malt kilns in Calgary, Alberta, Canada. He averaged 20 projects a year for the remainder of the decade including 38 complete brewing plants. In 1898 he built the National Brewery in Christiania (now Oslo), Norway, and in 1899 the Cervezeria Palatino in Havana, Cuba (Fig. 13).

Throughout his career, nearly 300 of his projects were in Pennsylvania, and over 200 of those were in the city of Philadelphia. In addition, he built eleven breweries in New York State, six of which were in New York City (Fig. 14) and two in Brooklyn. One of the more unique projects that year was a three-barrel experimental brewery and malt house for the United States Brewers' Academy in New York City. His firm also built seven breweries in Baltimore and three in Boston, and his clientele extended across the country, as in his design for the Buffalo Brewery, Sacramento, California (Fig. 15).

Wolf completed multiple projects over the years for many clients, especially in Philadelphia, where he built 28 breweries and completed nearly 190 projects, only 16% of which were not brewery-related. He had a hand in virtually every brewery complex in the neighborhood known as Brewerytown, including Arnholt & Schaefer (five projects between 1893 and 1898), Baltz (17 projects between 1886 and 1905), Bergner & Engel (35 between 1884 and 1912) (Figs. 16, 17), Eble & Herter (one in 1887), Keller (two between 1896 and 1898), Mueller (four between 1884 and 1892), Poth (19 between 1883 and 1909) (Fig. 18), and Rothacker (two in 1897).⁶ The Brewerytown neighborhood would grow far beyond the concentration of breweries to include allied industries and a community, mostly of German-Americans, with all kinds of buildings (Fig. 19). In 1991

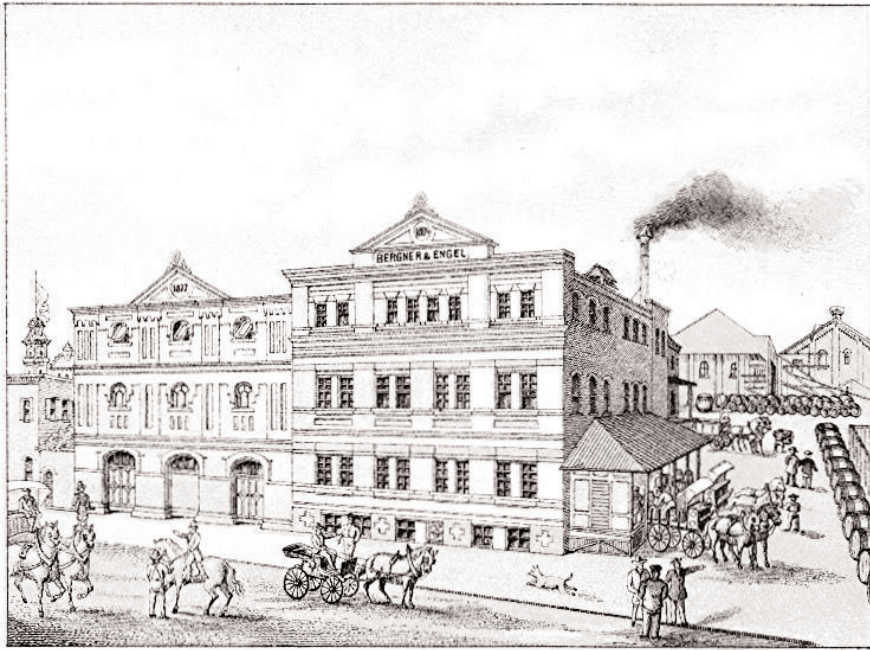


Figure 4. Bergner & Engel was Philadelphia's largest brewer. Their new ale and porter brewery built in 1884 added 50,000 bbl. to their output. (c.1884) Bergner & Engel Brewing Co. Illustrated. Philadelphia: Bergner & Engel, n.p. (Handy Collection).



Figure 5. In 1886 Wolf made alterations to Bergner & Engel's ice house so wagons and cars could be loaded in a refrigerated environment during the summer months. (c.1888) Bergner & Engel Illustrated. n.p.

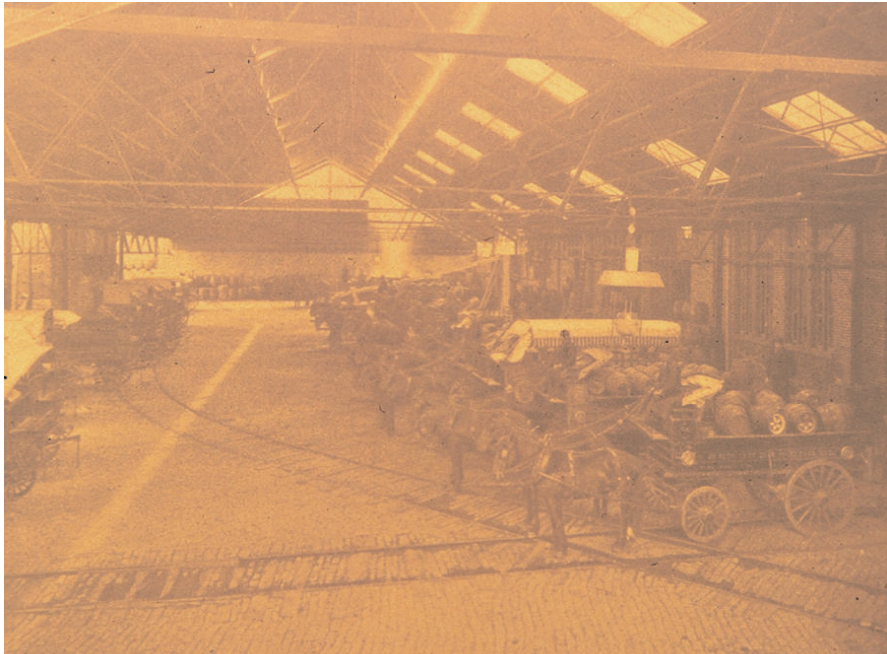


Figure 6. Photograph of Bergner & Engel's shipping department. Modern Brewing of an Ancient Beverage. (1896) Philadelphia: Bergner & Engel. n.p.



Figure 8. John F. Betz was one of Philadelphia's most prominent brewers who owned a number of plants in New York City. He and another investor contracted with Wolf to build the Germania brewery with a 100,000-bbl. capacity in 1886. (1896) Souvenir of Philadelphia. Philadelphia: United States Brewers' Association, n.p.



Figure 7. The Bergdoll 200,000-bbl. brew house built in 1886 was rehabbed a century later to become The Brewery Condominiums. In the application for placement on the National Register of Historic Places it is described as having ‘an originality which is characteristic of the architecture being produced in Philadelphia in the 1880s in the wake of Frank Furness, and is reminiscent of his work’. Photo by the author:

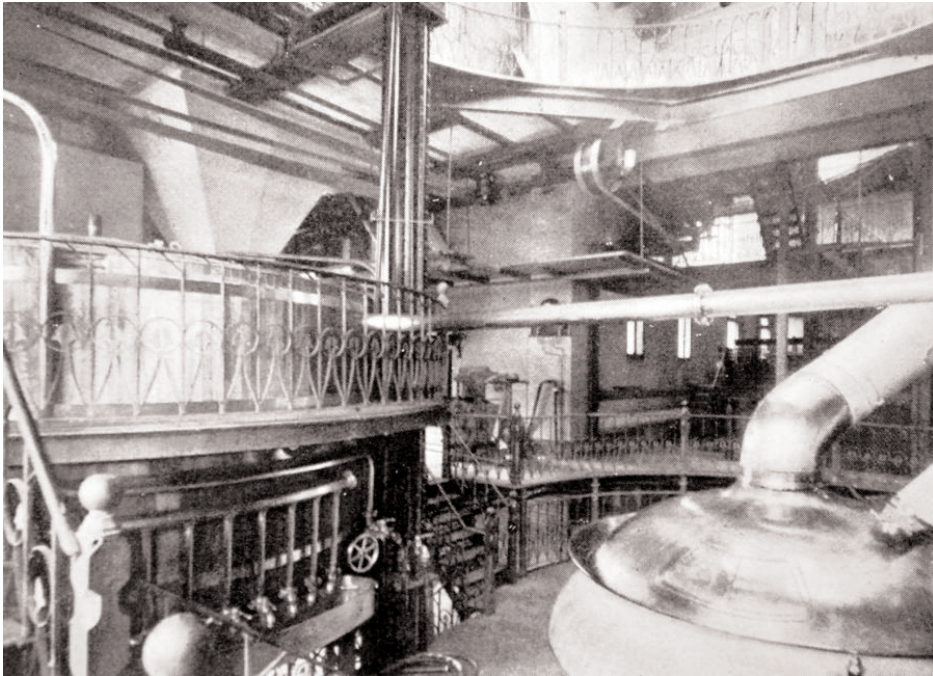


Figure 9. Interior of the 1886 brew house of the Germania brewery. U.S.B.A. (1896) Souvenir. n.p.



Figure 10. Opera house adjoining the Germania brewery. Note brew house to the left. U.S.B.A. (1896) Souvenir. n.p.



Figure 11. Wolf completed the Philadelphia Warehousing and Cold Storage plant in 1889. Photo by the author.



Figure 12. The Northwestern Market was built for six Philadelphia brewers in 1890. Wolf, O.C. (1906) *Breweries and Allied or Auxiliary Buildings* by Otto C. Wolf. *Philadelphia: G.M.S. Armstrong, n.p.* (Van Wieren Collection).

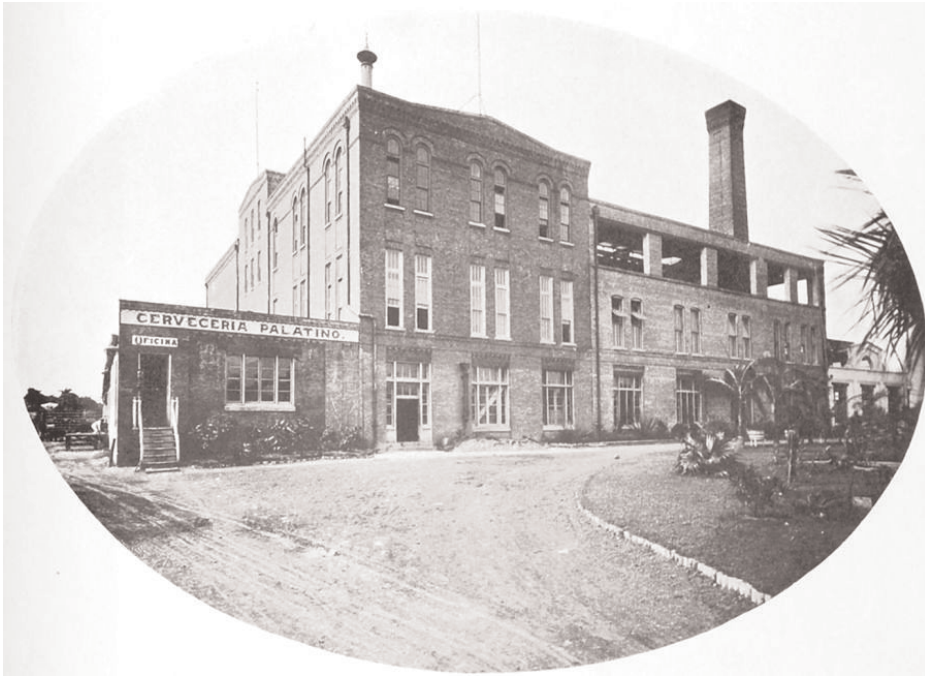


Figure 13. One of the international projects executed by Otto C. Wolf was the *Cervecería Palatino* in Havana, Cuba, built in 1899. Wolf, O.C. (1906) *Breweries and Allied or Auxiliary Buildings by Otto C. Wolf*. Philadelphia: G.M.S. Armstrong, n.p.

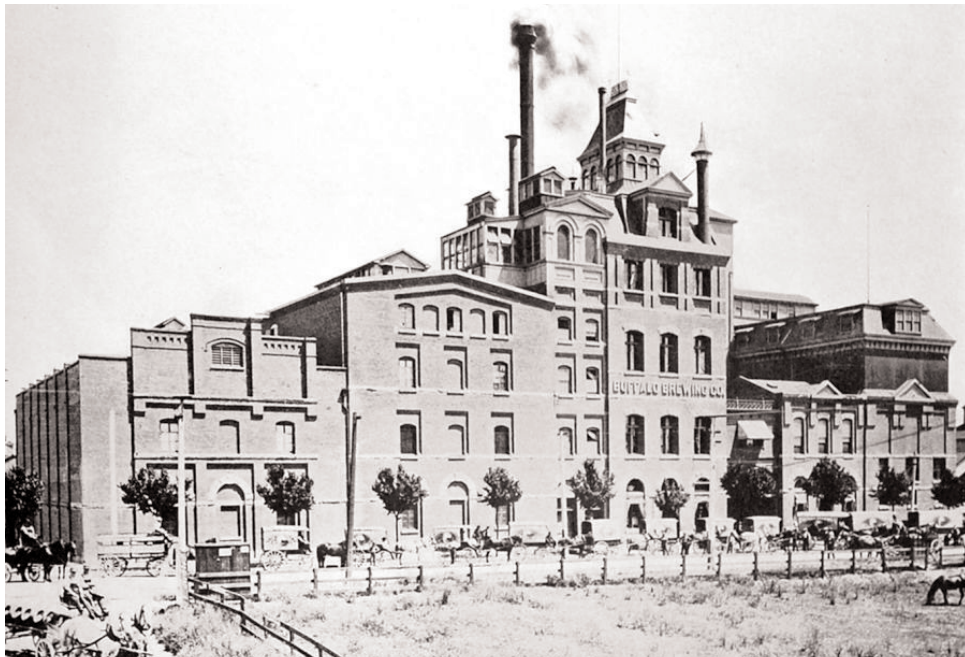


Figure 15. Buffalo Brewery (75,000 bbl.), completed in 1888 in Sacramento, CA. The following year Wolf was commissioned to build an office, stables, bottling plant and a 75,000-bu. Saladin malt house. Wolf, O.C. (1906) *Breweries and Allied or Auxiliary Buildings by Otto C. Wolf*. Philadelphia: G.M.S. Armstrong, n.p.



Figure 14. One of six projects executed by Wolf in New York City was a new brew house for the George Ringler brewery in 1890. It contained two 350-bbl. kettles. The following year Wolf designed an office. In 1893 Ringler purchased an ale brewery in New Haven, CT and the following year had Wolf make alterations to that plant as well. Wolf, O.C. (1906) Breweries and Allied or Auxiliary Buildings by Otto C. Wolf. Philadelphia: G.M.S. Armstrong, n.p.

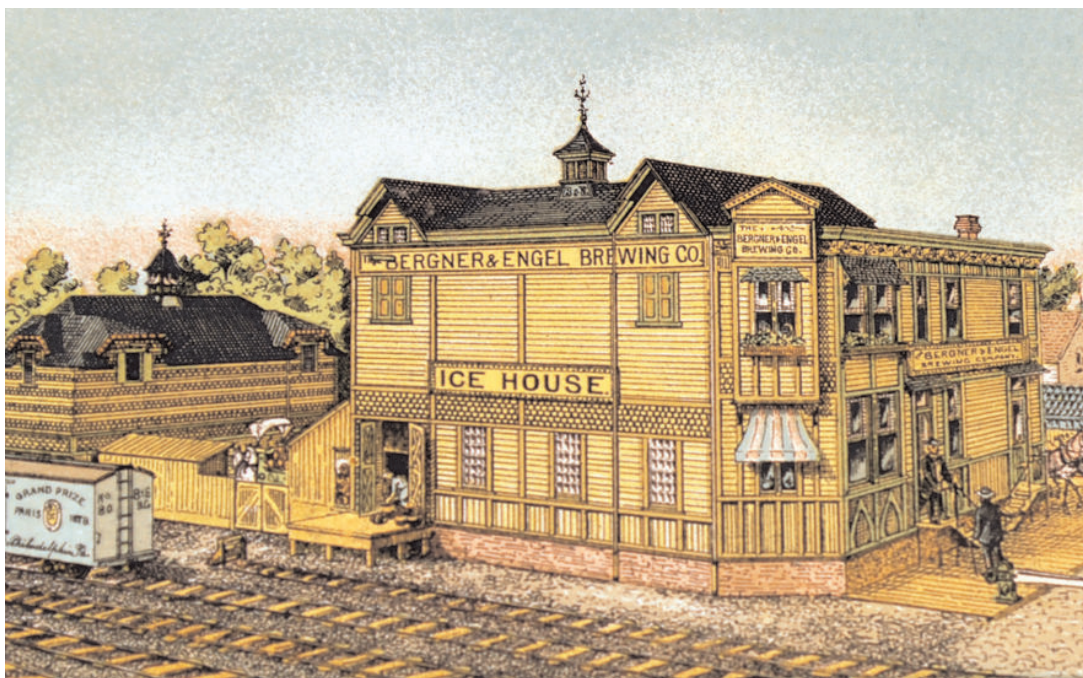


Figure 16. Bergner & Engel had Wolf design 14 depots up and down the eastern seaboard that were served by their refrigerated rail cars. Their depot in Washington, D.C. included a bottling house. This is a view of their depot in Sea Isle City, NJ completed in 1887. (c.1888) Bergner & Engel Brewing Co. Illustrated. Philadelphia: Bergner & Engel, n.p.



Figure 17. One of two remaining brewery buildings in Philadelphia's Brewerytown neighborhood is this 200-horse stable that Otto C. Wolf designed for Bergner & Engel in 1891. Photo by the author.

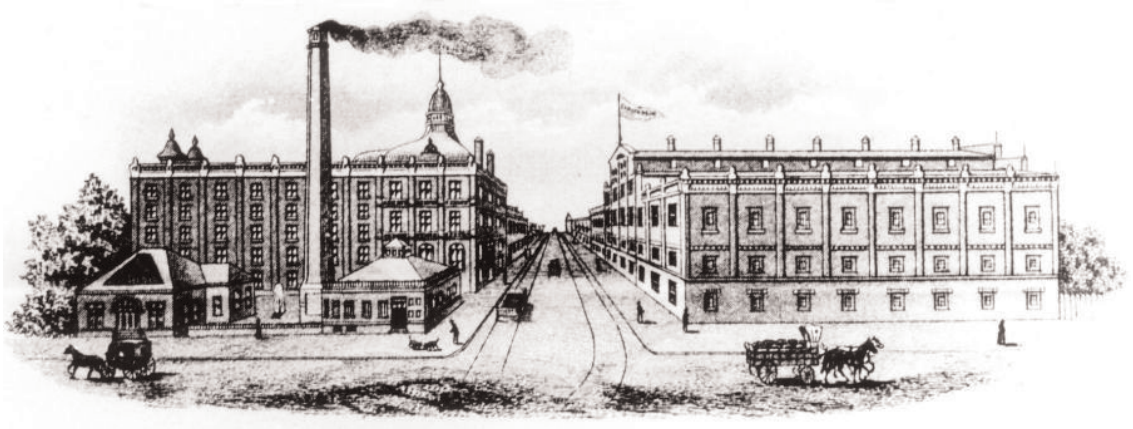


Figure 18. From 1883 to 1905 Wolf completed over a dozen projects for the Poth brewery. This view of the plant complex includes the new brewery (left) and stock house (right) completed in 1892. Poth letterhead (Handy Collection).



Figure 19. The Northwestern Bank built in 1886 became known as the 'Brewers' Bank'. Otto C. Wolf was vice president. Wolf, O.C. (1906) *Breweries and Allied or Auxiliary Buildings* by Otto C. Wolf. Philadelphia: G.M.S. Armstrong, n.p.



Figure 20. In 1897 Otto C. Wolf built a country residence and stable for Harry Rieger, secretary and treasurer of the Bergdoll brewery. Photo by the author.



Figure 21. In 1896 Wolf designed this carriage house for Christian Schmidt. It included an elevator capable of raising a carriage to the second floor when not in use. The building is now an architect's office with an apartment upstairs. Photo by the author.



Figure 22. Christian Schmidt's son, Henry C., had Otto C. Wolf build a residence for him in the outskirts of Philadelphia in 1898. Wolf, O.C. (1906) *Breweries and Allied or Auxiliary Buildings by Otto C. Wolf*. Philadelphia: G.M.S. Armstrong, n.p.



Figure 23. Bergdoll Mansion, 1885. Photo by the author.



Figure 24. Row of seven apartment houses, Powelton neighborhood, Brantwood, 1891. Built for F.A. Poth and E.A. Schmidt. Photo by the author.

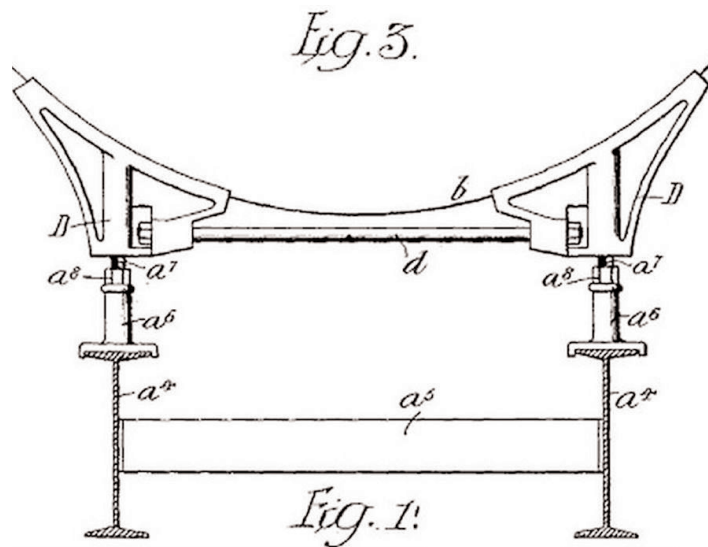


Figure 25. United States Patent No. 831,399, patented 18 September 1906, O.C. Wolf, Supporting Structure For Tanks.
[https://www.google.com/patents/US831399?printsec=description&dq=Otto+C.+Wolf](https://www.google.com/patents/US831399?printsec=description&dq=Otto+C.+Wolf&ei=uiIdUrW_KdSqsQTcxoHQA#v=onepage&q&f=false)
[If &ei=uiIdUrW_KdSqsQTcxoHQA#v=onepage&q&f=false](https://www.google.com/patents/US831399?printsec=description&dq=Otto+C.+Wolf&ei=uiIdUrW_KdSqsQTcxoHQA#v=onepage&q&f=false) .



Figure 26. In 1911 Wolf completed a new brew house and power house for Philadelphia's Schmidt brewery. The brewing floor contained two 750-barrel kettles. This replaced the brew house he designed for Schmidt in 1887. This was the last of 33 projects that he did for this brewery. Anon (c.1940) C. Schmidt & Sons Brewing Co. Illustrated. Philadelphia, n.p.



Figure 27. View of the lauter tubs overlooking the kettle floor below. Anon (c.1940) C. Schmidt & Sons Brewing Co. Illustrated. Philadelphia, n.p.

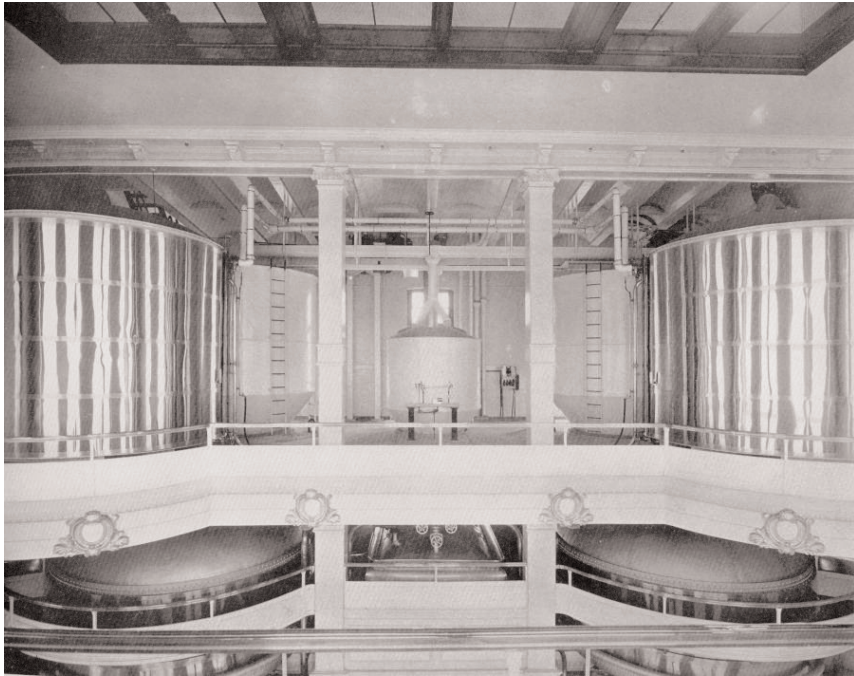


Figure 28. Hot liquor tanks were above the lauter tubs providing visitors with a grand view of the gallery or mezzanine.



Figure 29. View of Schmidt plant circa 1930, featuring the large clock tower above the brew house that was executed in 1911. The chimney of the power house was one of the largest and 'most magnificent' in the city.
http://ca.philaplace.org/media/philaplace/images/5/42438_ca_object_representations_media_542_hsp4.jpg.



Figure 30. In 1888 Wehr-Hobelman-Gott had Wolf build a 200,000-bbl. brewery, office, bottling house and stables for their Globe brewery in Baltimore, MD. Wolf, O.C. (1906) *Breweries and Allied or Auxiliary Buildings* by Otto C. Wolf. Philadelphia: G.M.S. Armstrong, n.p.

the neighborhood was granted status as a Historic District on the National Register of Historic Places. The Gombach Group has posted on their website an adaptation of their application for historic status, where they describe the German architecture of this period as being a counterpart to the English Queen Anne style, which emphasized subdivisions of wall surfaces, strong textures and complicated massing.⁷

In addition to industrial projects, Wolf designed a number of mansions and related buildings (Figs. 20-22), many for his brewer clients. Wolf's design for the Bergdoll mansion, built in 1885 (Fig. 23), is described as an example of the 'Germanic Northern Gothic' typical of buildings in the Brewertown neighborhood⁸ and was listed on the National Register of Historic Places in 1976.

Frederick A. Poth owned Brewertown's second largest brewery and applied many scientific principles to his

farm in Norristown, Pennsylvania, where he raised prize-winning dairy cattle. Wolf did a number of projects for Poth there, including a carriage house, stable, silo house and barn extension (1890). His son-in-law, Edward A. Schmidt, was the son of Christian Schmidt, the founder of a brewery across town that rivaled Poth's in size. In fact, Wolf designed the vast majority of buildings of the Schmidt brewery complex (24 projects between 1883 and 1911). In 1891 Poth and the younger Schmidt hired Wolf to design a row of seven apartment houses in the Powelton neighborhood (Fig. 24). The project is described by one critic as exhibiting the 'influence of Willis Hale's florid copies of Frank Furness's architecture'. These buildings have been renovated and are listed on the National Register of Historic Places.⁹ In addition to these, Wolf designed a dozen homes and summer cottages for clients in seaside communities in southern New Jersey, including an opera house and stores in Atlantic City.¹⁰

One can only imagine the magnitude of the workforce required to execute all of this work, but it must have been substantial. What is known is that in 1894 Kurt W. Peuckert, an engineer with 14 years' experience and who had worked for Otto Wolf for five years, began a career as a brewery architect and engineer in his own right.¹¹ Unfortunately, little other information has come to light regarding the size of the firm, about the people who worked for him, or about how many of them went on to become recognized on their own.

The United States Brewers Association (U.S.B.A.) was made up of brewery owners throughout the nation for the purpose of lobbying for their interests in Washington, D.C. In 1896 they held a convention in Philadelphia, and published a souvenir book containing photographs of over 50 breweries in the city, including interior views of the more substantial plants.¹² Philadelphia was Wolf's home base and he had completed projects for about half of them, in many cases entire brewery complexes.

Sometimes Wolf fulfilled roles beyond that of architect. At the turn of the century the owners of the Welde & Thomas brewery in South Philadelphia formed the Consumers Brewing Company with five other local firms as a means to increase production to meet the demand of the trade. Otto C. Wolf was on the board of directors and also served as president.

Otto C. Wolf was by no means the only architect and engineer to specialize in brewery design. Philadelphia alone was home to at least three other such firms, and brewing centers throughout the nation had a proliferation of architects to serve the trade. Naturally, there was quite a bit of competition among them for prestige and business. Wilhelm Griesser was a brewery architect originally based in Chicago, who patented a system of building brewery floors which he claimed used 30% less iron than previous designs. He did a project for the Monumental Brewing Co. in Baltimore. Otto C. Wolf was subsequently hired for alterations to Griesser's project. He refuted Griesser's claims in a letter to the editor of *The Western Brewer* in December 1900, in which he stated that the reconstruction done by the Roebling Construction Co. cost no more than Griesser's original arched floors, alerting readers to the existence of other companies with patented floor designs. Wolf called Griesser's claims fictitious and called into ques-

tion Griesser's casting aspersions on users of 'old methods of floor construction'.¹³

By the turn of the century Wolf's reputation as Philadelphia's preeminent brewery architect and engineer was widely recognized. In May of 1901, Wolf applied for membership in the American Institute of Architects. Along with his letter he included a copy of the U.S.B.A. *Souvenir* of 1896 with his projects marked in blue pencil. One can imagine his reaction when the application was rejected. He respectfully replied to the organization:

I very much regret that the photographs which I submitted to your Executive Committee, of buildings erected by me, did not meet the standard required for associate membership in the American Institute of Architects.

In your circular soliciting membership to the Institute, you set forth the desirability of having all practicing Architects of honorable personal and professional standing, join your association for the purpose of maintaining its schedule of minimum charges, and the promotion of good fellowship and standing of the profession in the community.

I have been practicing in the profession for over fifteen years, and erected manufacturing buildings in all the principal cities in the United States, as well as in Cuba, and furnished drawings for buildings in Europe, the volume of my business averaging fully a million dollars a year. My charges have been uniformly based upon the schedule fixed by the Institute; that is to say, five per cent for full professional services.

My standing in the community is unquestioned, being an alumnist of the University of Penna., Class of '76 now President thereof; a Director of the Northwestern National Bank; one of the Board of Managers of the Franklin Institute; a member of the Union League of this city ...

He re-submitted his application with photographs of 'house work' that he had designed. After waiting nearly three months, he again contacted the A.I.A. to find out the result of his request for reconsideration. Two weeks later he was elected as an Associate member.¹⁴

Engineers' designs are expected to be efficient, doing more with less, saving money and materials wherever possible without sacrificing structural integrity. One

such innovation can be seen in a patent Wolf received in 1906 for 'Supporting Structure for Tanks' (Fig. 25), designed for horizontal Pfaudler steel tanks. The supports rested on two I-beams running parallel to and beneath the tank, which rested on a saddle between the supports. This provided for an 'open floor' arrangement in multi-story stock houses.¹⁵

One of Wolf's last major projects was the new brew house and power house he did for the Schmidt brewery in Philadelphia in 1914 (Figs. 26-29). The five-story brew house was outfitted with two 750-barrel kettles, two lauter tuns with 25-cock grants, two 500-barrel hot liquor tanks and a 1,500-bushel spent grain tank. The power house contained 1,000-ton coal bins, was capable of producing 1,600 h.p. (with space for an additional 600-h.p. unit) and boasted the second tallest smokestack in the city. All of these features brought the annual capacity of the plant to 200,000 barrels.

Less than two years after the Schmidt project, *The Western Brewer* reported in January 1917 that Wolf had died on 19 December 1916, shortly after his sixtieth birthday, 'from a nervous collapse brought on by over-work'. His obituary went on, drawing attention to the breadth of his interests and activities:

At the time of his death he was president of the Philadelphia Yeast Manufacturing Co., vice-president of the Northwestern National Bank, trustee and active supervisor of the German Hospital, trustee of the Atlantic Telephone Co., member of the American Association of Mechanical Engineers, of the American Institute of Architects and the Philadelphia Chapter of that organization, and of the Franklin Institute; also of the Advisory Committee of the University of Pennsylvania, mechanical section, a member of the Union League, the Engineer's Club, the University Club and University Alumni Association, and a director of the Blooming Grove Hunting & Fishing Association. He was also a member of St. Paul's Lodge, 481, A.F. and A.M., of Mary Commandery and of Lu Lu Temple.

While serving on the directorate of the Bergner & Engel Brewing Co., he was a trustee of the United States Brewers' Association. He also served a number of years as the president of the Consumers Brewing Co. of Philadelphia.

His frequent comment was that he was busy but never too busy to take on one more duty. Much of his time for years

had been devoted to the direction and management of affairs that brought him no financial returns. His advice and aid were freely given whenever sought by anyone in whom he was interested. He leaves hosts of friends and grateful acquaintances.

Mr. Wolf is survived by his widow, a son and a daughter. His mechanical engineering and architectural business will be continued by his son, Carl B. Wolf, and the efficient corps of assistants trained by himself.¹⁶

Two books chronicle the work of the Otto C. Wolf firm: *Catalogue of Work Executed Accompanied by Illustrations* (1891) and *Breweries and Allied or Auxiliary Buildings* by Otto C. Wolf (1906). The first contains line drawings, and the second has photographs (Fig. 30), both of which provide a visual record of his impressive achievements. To date, the author has identified and photographed over a dozen extant buildings designed by Philadelphia's premier brewery architect and engineer. It is quite possible that numbers of others are yet to be found.

Acknowledgements

I would especially like to thank Dr Susan Appel for sharing her notes from *The Western Brewer* on Otto C. Wolf with me in 1985. The detailed information she provided encouraged me to pursue my own research with more sophistication and to focus my attention on brewery architects and architecture.

Breweriana Collectors Larry Handy and Dale Van Wieren have kindly permitted me to photograph books in their collections for illustrative material in this article.

Thanks to the staff at the Athenaeum in Philadelphia, the Beer Institute Library in Washington, D.C., the Canadian Center for Architecture in Montreal, Quebec, and the Pennsylvania Archives for their permission to examine and use resources in their collections.

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