

The Owens Bottle Co.

Part 1 – History

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[Most of the history in this study was originally published in Lockhart et al. (2010).]

Because both the history and the study of the marks and logos of the Owens firms were so large, we have presented the study in two parts. Part 1 deals with the history of the entire Owens Bottle Machine Co. (1903-1919) and the Owens Bottle Co. (1919-1929) as well as histories of each individual factory. Although plants that were owned by Owens but operated under their own names are included in this study (e.g., the American Bottle Co. or the Graham Glass Co.), each also has its own section in the Encyclopedia. The very complex system of logos, factory identification codes, date codes, and other markings is presented in Part 2.

The Owens Bottle Co. (1919-1929) was part of a series of companies that began with the Toledo Glass Co. (1895-1920), the firm that developed the Owens Automatic Bottle Machine. The principal investors in the Toledo company then created the Owens Bottle-Machine Co. (1903-1919) to manufacture and lease the Owens Machine, and the latter company in turn created a series of subsidiaries to make bottles, before renaming itself the Owens Bottle Co. Much of the confusion that still surrounds the early history of the Owens machine, in fact, derives from the seemingly compulsive tendency of the machine's backers for creating additional corporations to deal with current opportunities or new functions.

The story of the Owens Automatic Bottle Machine has been retold in numerous publications (e.g., Scoville 1948:101-174; Skrabec 2007:183-268; Walbridge 1920). The dates given, however, are often confusing. It is correct that the first fully automatic bottle machine was patented by Michael J. Owens in 1903. However, bottles were not first produced on the machine until the following year (1904), the year credited by almost all the early articles (e.g., *Journal of Industrial and Engineering Chemistry* 1914:864). Although some production began in October 1904, the best *practical* date for the use of the machine would be 1905 when serious commercial production actually began (Miller & McNichols 2002:2).

Even that fails to tell the full story. As noted by Jones and Sullivan (1989:35-39), there is no way to tell whether a bottle was produced on a semiautomatic or fully automatic machine, aside from the Owens scar visible on early Owens-machine-made bottles. By 1896, machines were used to make wide-mouth bottles and fruit jars in the U.S. Semiautomatic machines were making narrow-mouth bottles by 1901 (*Journal of Industrial and Engineering Chemistry* 1914:864). Thus, narrow-mouth bottles with automatic machine characteristics were available (albeit not in large quantities) two years prior to the generally accepted date for automatic machine-made bottles (1903), while Owens-made bottles were not *generally* available for another two years (1905).

Early semiautomatic machines only automated a small part of the process; the rest was accomplished by hand. This entailed a two-part operation. For narrow-mouth bottles, a gob of glass was dropped into a blank or parison mold, where a puff of air formed the upper end of the bottle (known as the “finish” from the early days when that was the final operation in bottle making) and created a small opening in the throat of the blank or parison. The parison was then transferred to a second mold, generally called the “blow” mold, where another puff of air blew the bottle into its final shape. As time passed, more and more of these operations became automated, until only the gathering and application of the initial gob of glass continued to be accomplished by hand. The Owens machine used suction to introduce the glass to the parison mold, automating the only stage that was still only accomplished by hand. The machine was now fully automatic (Figure 1).

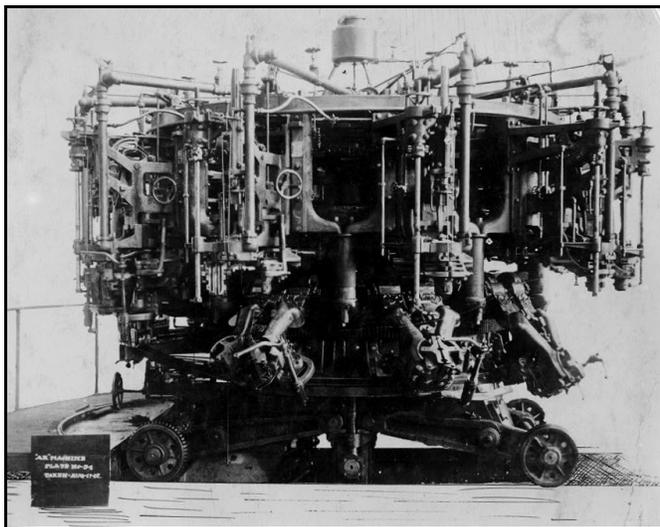


Figure 1 – Owens 10-Arm Machine (Jacob Riis)

The Owens Bottle-Machine Co. initially offered exclusive licenses for specific types of bottles. For example, the American Bottle Co. completely controlled the manufacture of soda and beer bottles by the Owens machine from 1905 to 1929, and the Thatcher Mfg. Co. was the sole licensee for milk bottles during a similar period (see the sections for both companies for

details). Corporations owned by Owens controlled grape juice and catsup bottle manufacture. By ca. 1909, the company woke up to the idea that it was cutting itself out of the bottle making business and ceased the exclusive license practice, while still restricting the number of companies allowed to manufacture certain types of bottles. For example, liquor bottles were licensed to the Charles Boldt Glass Co., the Illinois Glass Co., and Owens-controlled plants. Thus, different types of bottles began to be made by Owens machines at different times (see Miller & McNichols 2002:3, 6-8).

History – Overview

As with many of the larger companies, a historical assessment needs to be approached on two levels: the overview and the local view. The company underwent two phases in its development: the Owens Bottle-Machine Co. and the Owens Bottle Co. Within each of these phases, the company owned or controlled several different plants, and the relationship between the company and the plants changed over time.

Owens Bottle Machine Co. (1903-1919)

The Owens Bottle-Machine Co. was incorporated in New Jersey on September 3, 1903, with a capital of \$3,000,000 and reorganized as an Ohio corporation on December 16, 1907. The main purpose of the company was to manufacture and license the use of the Owens Automatic Bottle Machine, but it also maintained the right to manufacture and deal in glass and to hold stock in other companies. The new company took control of the Toledo Glass Co. plant at Toledo, Ohio, and acquired the right to use the Toledo Glass Co. patents for the Owens machine in the United States (Moody's 1932:2209; Owens-Illinois [1945]:6; Scoville 1948:101-102; Toulouse 1971:393; Walbridge 1920:67).

The Toledo Glass Co. had been formed as an offshoot of the Libbey Glass Co. in 1895. The company built a factory at Toledo with a 14-pot furnace and several tumbler machines. Through a series of negotiations, Toledo Glass ceased tumbler manufacture by 1900 and became devoted to the development of an automatic machine for bottles. There, Michael Owens invented his initial machine (Scoville 1948:96-98; Miller & McNichol 2002:1).

Skrabec (2002:207) stated that “Owens pushed for the need for an ‘experimental’ plant to promote his machine and help machine sales. Under this initial guise, he got the approval for a plant. Construction was started immediately near the old shed on Libbey Street (known today as Wall Street).” Skrabec’s positioning of this statement immediately after discussing the founding of the Owens Bottle-Machine Co. in 1903 makes it sound like the Owens company built the plant *after* it was founded.

But this was not the case. A glass trade account in May, 1903, indicates that the “model plant” was “built and about to be operated” (*National Glass Budget* 1903) more than five months before the creation of the Owens Bottle-Machine Co. Walbridge (1920:67), one of the officers of the Toledo and Owens companies, stated that “the newly formed company [i.e., the Owens Bottle-Machine Co.] took over the plant of the Toledo Glass Company” Scoville (1948:102) agreed, stating that “Toledo Glass . . . handed over its experimental plant which had been built on Libbey Street in Toledo” – confirmed by Toulouse (1971:393). It is thus clear that the initial “experimental” factory of the Owens Bottle-Machine Co. was the older Toledo Glass plant on Libbey St.

The growth of the Owens Bottle-Machine Co. was slowed by two depressions. The company was founded during the panic of 1903, and production was slowed by the panic of 1907. By 1907, the Owens firm only had three licenses in use. Because of these depressions, few companies could afford the expenditures required to install the costly Owens machinery, which frequently required the construction of new buildings and furnaces. Thus, “the efforts of Owens Bottle from 1903 to the end of 1907 could not be said to be entirely successful” (Owens-Illinois [1945]:12).

The company quickly realized that it was losing a tremendous profit-making opportunity by not manufacturing bottles, itself. The firm created three other corporations (in 1904, 1909, and 1912 – see below) to make bottles and issued them licenses, although it retained the license for vinegar, grape juice, and narrow-mouth food (notably catsup) bottles in the name of the Owens Bottle-Machine Co. in 1908 (Miller & McNichol 2002:7; Toulouse 1971:394). This retention by the parent company was probably so that they could allow *any* companies under the Owens umbrella to make such bottles. In 1909, the firm similarly retained the license for prescription bottles (Miller & McNichol 2002:7; Scoville 1948:110), although it also licensed the Whitney Glass Works and Illinois Glass Co. to make prescription ware.

Initially, the Owens operation issued exclusive licenses for the use of its machines to produce particular categories of ware, e.g., beer, soda and porter bottles to the Ohio Bottle Co. (later American Bottle Co.);¹ milk bottles to Baldwin-Travis (later the Thatcher Mfg. Co.).² Soon, licenses became less exclusive; the Illinois Glass Co., Charles Boldt Glass Co., and the Owens West Virginia Bottle Co. all received licenses to make liquor bottles³ (Miller & McNichol 2002:2; Scoville 1948:104-105, 107).

Originally, Owens only leased the machines to its licensees. Because of the threat of the Sherman Anti-Trust Act, Owens changed its tactics and vested the ownership of the machines in each of the licensees in January 1912 (Scoville 1948:108). In 1913 and 1914, the Owens management begged its exclusive license holders to sub-license Owens to manufacture bottles on its own machines – with little success. Thatcher was the only one who granted that option – in return for a reduction of the royalties from 40 cents to 10-15 cents per gross. Owens was granted permission to make 50,000 to 150,000 gross of milk bottles per year for Thatcher at the Clarksburg plant (Scoville 1948:104-107). The original plant (No. 1) retained its experimental machines but did not expand its production. By November 1916, the plant still only had a single 10-arm experimental machine (Palmer 1917:212).

¹ Ohio Bottle obtained an exclusive license in 1904 for production of beer and soda bottles on the Owens machine. The first machine, however, did not arrive until the following year, and it was installed in a new factory owned by the Newark Machine Bottle Co. – a corporation controlled by the Toledo capitalists at Owens. This company received a sub-license from Ohio Bottle (continued by its successor, American Bottle), which sold the bottles made by Newark Machines, an arrangement that lasted at least until 1907. It eventually consolidated with American Bottle (*Newark Advocate* 1905a; 1905b; 1907; Scoville 1948:104, 146).

² The first machine was actually installed at Baldwin-Travis, Kane, Pennsylvania, on December 16, 1903. The firm had recurring problems and was unable to make the machine operational. By October of the following year (1904), Baldwin-Travis had ceased making payments to the Owens Bottle-Machine Co., which almost caused the Owens company to become insolvent. The Thatcher Mfg. Co., successor to Baldwin-Travis, signed a new lease on September 16, 1904, but continued having difficulties with the machinery, although production commenced in 1905. By 1908, Thatcher wanted to return machines to the Owens firm and stop paying royalties (Lockhart et al. 2007c; Owens-Illinois 1943).

³ Oddly, the Owens-Illinois legal history (1943) indicated that the Owens West Virginia plant was actually sub-licensed by the Illinois Glass Co. and the Charles Boldt Glass Mfg. Co., both holders of Owens licenses, to make liquor bottles.

During the teens, Owens began to expand by acquiring the controlling stock of some of its rivals. Owens gained control of the Whitney Glass Works, Glassboro, New Jersey, in 1915, but the company retained its own identity until 1918. In 1916, Owens gained complete control of both the American Bottle Co. and the Graham Glass Co., although both retained their identities. The following year, the firm purchased the former Greenfield Fruit Jar & Bottle Co., Greenfield, Indiana, from its owner at the time, the Ball Brothers Glass Mfg. Co. (Owens Bottle-Machine Co. 1917; Toulouse 1971:396; Scoville 1948:110, 113; Walbridge 1920:106).

The firm also began production at the new factory in Charleston, West Virginia, by the end of 1918 and abandoned the old Whitney plant in 1919 (Toulouse 1971:397; Walbridge 1920:107). This was followed by a similar takeover of the Charles Boldt Glass Co., also in 1919 (see Table 1 and individual plant discussions below). Between 1911 and 1919, the Owens Bottle-Machine Co. controlled a total of 17 plants, although four had closed by 1920. The Owens Bottle-Machine Co. was renamed the Owens Bottle Co. in 1919.

Owens Bottle Co., Toledo, Ohio (1919-1929)

On May 1, 1919, the Owens Bottle-Machine Co. adopted the name that would make it famous as a bottle manufacturer: The Owens Bottle Co. (Moody's 1932:2209; Scoville 1948:101; Walbridge 1920:111-112).⁴ The company had previously been known primarily as maker of machines with bottles as a sideline. By this time, Owens had acquired or built all the factories that it would own (see Table 1). We have been unable to find a record of any acquisitions between 1920 and the merger with the Illinois Glass Co. in 1929.

In 1927, the combined plants operated 18 continuous tanks that made “prescriptions, patent, proprietary, packers and preservers, catsup, vinegar, salad dressing, fruit juices, narrow neck, etc.” (*American Glass Review* 1927:141-143). This listing continued until 1929, when the Owens Bottle Co. and the Illinois Glass Co. merged to form the Owens-Illinois Glass Co.

⁴ According to the Owens-Illinois legal history, the official date for the name change was April 19, 1919 (Owens-Illinois 1943). May 1 must have been the date that the change was released to the press.

History – Individual Plants

This section is organized by plant numbers, where available, and otherwise by dates. The divided organization is necessary to address acquisitions that did not fall under the Owens numbering system. The numbering system was apparently developed fairly early, probably by 1911, when the Owens Bottle-Machine Co. officially acquired the second factory in Toledo and the one in Fairmont, West Virginia. It was certainly in place by at least 1913 (Owens Bottle-Machine Co. 1913). The system was complicated because Owens gained control of several companies (Whitney Glass Works, 1915; American Bottle Co., 1916; Graham Glass Co., 1916; Charles Boldt Glass Co., 1919), some of which had several plants. These were *not* given Owens numbers but continued to operate under their former names.

To add further complexity, the Whitney and Boldt plants were later given Owens numbers. Thus, in the following section (and in Table 1), the factories are addressed in numerical order from Plant No. 1 to Plant No. 4, followed by the controlled companies that never received numbers, followed by the remaining numbered plants, even though the Owens company gained control of some of those earlier.

The system was adopted and expanded in 1929 to include all the glass plants of the newly-formed Owens-Illinois Glass Co. Eventually, the plant codes were used to mark the bottles that each factory produced, and this has inspired considerable interest in determining which numbers designated which factories. Strangely, although the system was used systematically within the company, external references (newspaper accounts, directory listings) almost never mention the numerical designation of a factory. Absent research in corporate archives, the best sources for the early codes seem to be the Annual Reports prepared for the stockholders. Some of these were published verbatim in the trade literature, while we have obtained a few others from company sources.

Plant No. 1⁵ – Owens Bottle-Machine Co. (1903-1919)

Plant No. 1 – Owens Bottle Co. (1919-1929)

This was the experimental and demonstration factory, located on Libbey St. in Toledo. As noted above, the original Owens machine was developed at the Toledo Glass Co. factory. The company built the new experimental plant in 1903. With its single machine, the experimental factory produced bottles, initially perhaps for demonstration purposes. Beginning in October 1904, however, machine operation at the plant fell under the control of the Northwestern Ohio Glass Co., which (pending construction of its own plant) began making beer bottles. All bottles made at the plant were sold through the Ohio Bottle Co., although the original output went to Mexico. Sales in the U.S. probably did not begin until 1905 (Scoville 1948:109; Skrabec 2002:230; Toulouse 1971:393). See the next section on the Northwestern Ohio Bottle Co. and Lockhart et al. (2007a) for a more thorough discussion.

The American Bottle Co., successor to the Ohio Bottle Co. continued the same policy. On January 18, 1906, however, American Bottle, now secure in its own production, instructed Owens to cease making bottles for its account. In April 1906, the plant began making catsup bottles for local firms and added pharmaceutical and proprietary medicine bottles in 1912 (Scoville 1948:109; Skrabec 2002:230; Toulouse 1971:393). In 1912, the plant burned. The company rebuilt the factory, still using the No. 1 designation (Smith 1976:1; Walbridge 1920:93). Although sources are unclear, it is likely that pharmaceutical and proprietary medicine bottles were added when the new plant was opened.

The new plant housed the company's departments for machine designing, construction, and molds. By 1916, two machines in the factory made catsup bottles, gallon packers, and siphon bottles. Prior to this addition, virtually all siphon bottles were imported. The following year, the plant received a new furnace, fueled by oil (Owens Bottle-Machine Co. 1916; 1917). The factory remained in business long enough to become Plant No. 1 for the Owens-Illinois Glass Co., after the 1929 merger (Scovill 1948:113; Toulouse 1971:395).

⁵ This designation is slightly misleading. Although Toulouse (1971:393) claimed that the factory became Plant No. 1 on September 3, 1903, it was the *only* factory at that time and needed no numerical designation until 1911, when both Northwestern Ohio Bottle Co. and Owens West Virginia Bottle Co. became officially attached to the Owens Bottle-Machine Co.

Northwestern Ohio Bottle Co., Toledo, Ohio (1904-1911)

Plant No. 2 – Owens Bottle-Machine Co. (1911-1918)

Formed by the owners of the Owens Bottle-Machine Co., the Northwestern Ohio Bottle Co. was an Ohio corporation, established in June 1904 and incorporated on August 4 to make bottles with the Owens machine. In August 1904, the Ohio Bottle Co. (recently formed and licensed to make beer and soda bottles on Owens machines – that had not yet been installed) became the selling agent for beer bottles made by Northwestern. But Northwestern at that time had no factory and no machines. Consequently, it was allowed to use the Libbey Street experimental factory for commercial production beginning in October 1904. All of the beer bottles were to be sold by Ohio Bottle, and all were destined – at least initially – for markets in Mexico so as not to compete with home production (*National Glass Budget* 1904e:10; 1904f:1; Owens-Illinois [1945]:11; Skrabec 2007:209).⁶

Northwestern was licensed to make wine, whiskey, brandy, liquor, grape juice, and some “branded” medicine and “bitters” bottles on November 1, 1904 (Miller & McNichol 2002:6; Owens-Illinois [1945]:11; Scoville 1948:103, 106, 145-146; Skrabec 2007:209; Toulouse 1971:394; Walbridge 1920:72). The actual Northwestern plant in West Toledo was presumably completed in 1905. The plant originally used two Owens “A” machines and had 50 workers (Skrabec 2007:209). In January 1908, the Owens Bottle-Machine Co. purchased all the stock in Northwestern. The plant operated “two machines making 8-oz. catsups and whisky bottles” during that year (Hayes 1909:1; Owens-Illinois 1943; Scoville 1948:109).⁷ In 1911,⁸ Owens consolidated Northwestern into the larger company as part of its expansion into bottle

⁶ The 1904 scheme to restrict Owens machine beer bottles to Mexican markets was probably intended to avoid labor difficulties and to allay concerns from hand manufacturers, including E.H. Everett, the driving force in the creation of Ohio Bottle, who was then operating a huge bottle plant at Newark based entirely on hand production.

⁷ Although Scoville (1948:109) placed the stock purchase in 1909, the Owens-Illinois legal history (1948) indicates that the deal took place a year earlier. Toulouse (1971:394) added that the machines were AD models, and the plant also made vinegar, grape juice, and “other narrow-neck bottles.”

⁸ Moody’s (1932:2209) claimed a 1912 date for the absorption of both Northwestern and Owens West Virginia, and the Owens-Illinois legal history (1943) agrees with that date.

production. The installation became Plant No. 2 (Miller & McNichol 2002:6; Owens Bottle-Machine Co. 1916; Scoville 1948:103, 106, 110, 145-146; Toulouse 1971:394; Walbridge 1920:72).

Although the 1913 Owens Annual Report noted that “the factory operated in a satisfactory manner,” it was described as “the least modern of your company’s factories” the following year (*National Glass Budget* 1913b:1; 1915a:1). In 1914, Plant No. 2 still had two machines making “catsup and brandy bottles” (*Journal of Industrial and Engineering Chemistry* 1914:864). When the Westlake branch (Plant No. 4) was abandoned in 1915, two older machines at Plant No. 2 were removed, and the company installed the “newly constructed carboy machine” and operated it experimentally. The 1915 report described the bottles produced as being “of a very superior quality” (*National Glass Budget* 1915b:1).

The Annual Report for 1916, stated that “some years ago your directors decided to abandon [Plant No. 2], but increasing business necessitated a change in plans and modern equipment has been installed in order to fill orders and maintain dependable service” (Owens Bottle-Machine Co. 1916). In November 1916, the plant was listed as having one 6-arm and one 10-arm Owens machine, making “miscellaneous bottles” (Palmer 1917:212).

The Annual Report for 1917 noted that the installation was only used because “abnormal demand for [the] Company’s product necessitated the use of every facility in order to meet, as nearly as possible, the urgent requirements of customers.” The report described the plant as “the least modern of Company’s factories and will probably become a reserve plant as soon as new factories are in operation and its productive capacity can be spared” (Owens Bottle-Machine Co. 1917). That plan apparently changed. According to Toulouse (1971:394), Owens closed the plant, when it opened the Charleston factory in 1918.

Owens West Virginia Bottle Co., Fairmont, West Virginia (1909-1911)

Plant No. 3 – Owens Bottle-Machine Co. (1911-1919)

Plant No. 3 – Owens Bottle Co. (1919-1929)

The Owens Bottle-Machine Co. created the Owens West Virginia Bottle Co. in 1909 to receive a license on December 27 for “certain kinds of beverage bottles” – actually grape juice

bottles – to be made on Owens automatic bottle machines (Scoville 1948:105). The corporation was capitalized at \$100,000, and the new firm immediately built a “modern three-furnace, six-machine plant at Fairmont, West Virginia” (Scoville 1948:110) that was formally opened on October 1, 1910 (Toulouse 1971:394). The site near Fairmont, West Virginia, was chosen because of its proximity to the natural gas and coal fields, a steady supply of fuel (Walbridge 1920:80).

In 1910, plans were in place to install six 10-arm Owens machines at Fairmont (*National Glass Budget* 1910:1; Walbridge 1920:80). As noted above, the factory was sub-licensed by both the Illinois Glass Co. and the Charles Boldt Glass Mfg. Co. to make liquor bottles on July 10, 1910 (Owens-Illinois 1943). The Owens Bottle-Machine Co. consolidated the Owens West Virginia Bottle Co. into the larger firm during the last quarter of 1911 as part of its plan to increase bottle production (Scoville 1948:110), soon designating the installation as Plant No. 3. In 1914, twelve machines were in production at the Fairmont factory, making “liquor, catsup, and grape juice bottles.” The factory made grape juice bottles in 4- and 16-ounce sizes along with 9-ounce catsup bottles (*Journal of Industrial and Engineering Chemistry* 1914:864).

During 1912 and 1913, the plant added three additional furnaces equipped with AN and AR machines. Over the next few years, the factory replaced the older AE machines with more 10-arm AN and AR machines (Toulouse 1971:394). During 1913, the factory was expanded to six furnaces with an even dozen ten-arm machines. The plant was described as “the largest of your company’s factories” that was “maintained at the highest standard of efficiency” in the 1915 Annual Report. By November 1916, the Fairmont factory still made “liquors, bottles, preserves, and miscellaneous” ware at same twelve 10-arm machines (*National Glass Budget* 1913b:1; 1915b:1; Owens Bottle-Machine Co. 1916; Palmer 1917:212).

The location, however, was a poor choice. Owens built the factory in a narrow river valley. The topography caused gusty winds and spring flooding to disrupt production. Despite repeated warnings from advisors, Owens expanded the plant two years after its inception (Fones-Wolf 2007:165). The factory was still in operation in 1929, when the company merged with the Illinois Glass Co. (Scoville 1948:146) and it continued to operate under the same plant number within that corporation.

Westlake Machine Co., Westlake St., Toledo, Ohio (1908-1914)

Plant No. 4 – Owens Bottle-Machine Co. (1913-1915)

The history of this plant is somewhat confusing. Libbey, Owens, and several others with interests in both the Libbey Glass Co. and Owens Bottle-Machine Co. incorporated the Westlake Machine Co. on November 6, 1907. The new corporation built a factory on Westlake St. in Toledo at some point during 1908. It was established to develop a new machine that incorporated and combined the operating principles of the Toledo Glass Co. semiautomatic light bulb machine and the Owens (fully) Automatic Bottle Machine. The plant actually operated as a joint enterprise between Westlake, Libbey Glass, and the Owens Bottle-Machine Co. (Scoville 1948:113, 130, 165; Skrabec 2007:220, 275).

The Owens company became concerned that the experimental operations would conflict with commercial production in the newly rebuilt Plant No. 1 on Libbey St., constructed in 1912. To alleviate the concerns, the firm leased the Westlake St. plant and transferred experimental operations from Libbey St. to Westlake St. in 1913. This new experimental plant (Plant No. 4) was the focus of development work on furnaces and machines as well as chemical investigations regarding glass composition. It suffered a destructive fire in 1915 and was abandoned (*National Glass Budget* 1913b:1; 1915a:1; 1915b:1; Scoville 1948:113; Toulouse 1971:396). So far as we are aware, the Westlake St. factory in Toledo, was the only plant in the history of the system that was never used for commercial bottle production.

Owens Eastern Bottle Co., Clarksburg, West Virginia (1912-1914)

Plant No. 4 – Owens Bottle-Machine Co. (1914-1919)

Plant No. 4 – Owens Bottle Co. (1919-1929)

The Owens Eastern Bottle Co., Clarksburg, West Virginia, was created specifically to use the Owens automatic bottle machines at its new factory. The corporation was capitalized at \$1,000,000 and received a license on June 11, 1912, to make prescription, proprietary, and druggists' ware. Although the Owens Bottle-Machine Co. owned 51% of the stock, four other glass houses (Whitney Glass Works, Fidelity Glass Co., Cumberland Glass Mfg. Co., and Bellaire Bottle Co.) each were stockholders (Griffenhagen and Bogard 1999:103; Miller & McNichol 2002; Moody's 1932:2209; Scoville 1948:106, 110, 146; Toulouse 1971:394-396).

Although the actual consummation was still more than two years away, plans were already in place to install three machines at Clarksburg in 1910 (*National Glass Budget* 1910:1). Production did not begin until 1913, when the factory made medicine bottles and pharmaceutical ware on six Owens machines at three furnaces in 1913 (*National Glass Budget* 1913a; *Journal of Industrial and Engineering Chemistry* 1913:953). The plant operated five machines making “oval, round, square, and flat prescription bottles, panels and other small ware” the following year (*Journal of Industrial and Engineering Chemistry* 1914:864). In addition, the factory made milk bottles for the Thatcher Mfg. Co.⁹ (Toulouse 1971:396).

The first two years were not very profitable, and most of the original stockholders began to regret their decisions to invest. During December 1914,¹⁰ the Owens Bottle-Machine Co. bought out all the other stockholders and consolidated Owens Eastern into the larger company (*National Glass Budget* 1915b:1). The newly absorbed plant used six 10-arm machines to make prescription and proprietary ware, and that arrangement continued through 1917. The 1916 Annual Report stated that a second factory was being built and should be operational by May 1917, doubling the capacity at that location. Those plans, however, were dropped, and the plant remained in operation with six machines (*National Glass Budget* 1915b:1; Owens Bottle-Machine Co. 1916; 1917; Palmer 1917:212). The flow chart produced by Toulouse (1971:404) showed the Clarksburg factory as being closed ca. 1923, although he suggested that the plant closed in 1921 – possibly a typo for 1923 (Toulouse 1971:396). Although the plant remained No. 4 as part of the Owens-Illinois Glass Co., it was listed as idle in the firm’s reports from 1930 to 1944 at which point it disappeared from the record. Empirical evidence (bottle date codes) suggests that 1923 was, indeed, the final year of production.

⁹ Giarde (1980:76) noted that Owens Eastern made milk bottles but mistakenly thought that they might have been embossed with the Box-O mark.

¹⁰ Scoville (1948:110) placed the date at January 11, 1915, but we have accepted the December 1914 date from the 1915 Owens Annual Report.

American Bottle Co., headquarters in Newark, Ohio (1905-1916)

American Bottle Co. (Owens owned), Newark, OH, and Streator, IL (1916-29)

The American Bottle Co. grew out of the Ohio Bottle Co., established in 1904 to make soda and beer bottles with the Owens machines. The company became the American Bottle Co. in 1905 and rapidly became one of the largest beer and soft drink manufacturers in the United States. The Owens Bottle-Machine Co. gained control of the American Bottle stock in 1916. For more information, see Lockhart et al. (2007a) or the section on the American Bottle Co.

The Newark plant had been the flagship factory for American Bottle, but that began to shift after the second plant was built at Streator. The Annual Reports for 1916 and 1917 still listed Newark first, but, by 1920, the factories had been numbered, and American Bottle Co. No. 1 and No. 2 were located at Streator. The Newark plant was American Bottle Co. No. 3 (Owens Bottle-Machine Co. 1916; 1917; Owens Bottle Co. 1920). One Streator plant and the Newark operation survived to become part of the Owens-Illinois Glass Co. in 1929.

Graham Glass Co., Evansville, Indiana, and other locations (1907-1916)

Graham Glass Co. (Owens management), Evansville and Loogootee, Indiana; Okmulgee and Checotah, Oklahoma (1916-1929)

The Graham Glass Co. began in 1907. The Owens Bottle-Machine Co. purchased the entire stock of the Graham plants at Evansville and Loogootee, Indiana, in 1916 and acquired 50% of the stock of the factories at Okmulgee and Checotah, Oklahoma. Thus, the Owens company gained control of the Graham machine rights and feeder patents. This event led to legal battles between the Owens firm, Harford-Empire (the other major bottle machine manufacturer), and the federal government over who had what rights to what invention. These disputes lasted for the next quarter century (Owens-Illinois 1943).

Like American Bottle, the Graham plants continued to operate under the Graham name. Owens sold the Checotah plant to the Illinois Glass Co. in 1923 and closed the Loogootee plant in 1926. The Owens-Illinois Glass Co. shut down the Okmulgee branch in 1929 (Keller 1998:27; Toulouse 1971:216). For more information, see Lockhart (2004; 2006) or see the section on the Graham Glass Co.

Greenfield Fruit Jar & Bottle Co., Greenfield, Indiana (ca. 1902-1915)

Plant No. 5 – Owens Bottle-Machine Co. (1916-1919)

Plant No. 5 – Owens Bottle Co. (1919-1921)

The story of the exclusive Owens license for fruit jars is very convoluted. James A. Chambers (likely the son of David H. Chambers of A&DH Chambers, the long-lived Pittsburgh glass house) first obtained the license in 1906. Chambers allowed his option to expire, and it was picked up by Frank C. Ball the following year. Ball, too, allowed the option to lapse, and Louis Hollweg acquired the license on January 2, 1909. He assigned the rights to the Greenfield Fruit Jar & Bottle Co. in November of that year. A week later, Greenfield sold the rights (and the factory) to the Ball Brothers. By 1910, the Ball Brothers had paid more than four times the amount stipulated in Frank Ball's original option (Miller & McNichol 2002:7; Scoville 1948:105).

The Greenfield Fruit Jar & Bottle Co. grew out of Hollweg & Reese at Greenfield, Indiana, and began operations ca. 1902 with seven press-and-blow machines. For undisclosed reasons, Hollweg closed the plant between August 1905 and June 1906. The reopened factory continued to produce fruit jars, packers, and other jar types. Hollweg apparently installed the Owens machines at Greenfield between January and November 1909. They were almost certainly in place when the Ball Brothers purchased the factory (Roller 1994:38-40). See the Greenfield Fruit Jar & Glass Co. section for a history of the plant and marks prior to the Owens involvement.

The Ball Brothers Glass Mfg. Co. officially bought the Greenfield company on November 20, 1909. They continued to operate under the Greenfield Fruit Jar & Bottle Co. name and leased the Ball Factory No. 2, at Muncie, Indiana, to Greenfield to install three Owens AD (nine-arm) machines in late 1910. The Ball Brothers gradually transferred Owens machine operations entirely to Muncie and closed the Greenfield plant in May 1915 (Roller 1994:40-41). See the section on the Ball Brothers for more details about this period.

The Owens Bottle-Machine Co. acquired the operation in late 1916 or 1917, and it became Plant No. 5. The factory was completely overhauled and equipped with three Owens machines, commencing operations in May of the same year. The plant was intended to make

catsup bottles for the Frazier Packing Co. Owens closed the plant in 1921¹¹ (Owens Bottle-Machine Co. 1917; Roller 1994:41; Toulouse 1971:396; Walbridge 1920:106).

Plant No. 6 – Owens Bottle-Machine Co., Charleston, West Virginia¹² (1918-1919)

Plant No. 6 – Owens Bottle Co. (1919-1929)

The Owens Bottle-Machine Co. began construction of Plant No. 6 at Charleston, West Virginia, in 1917. The plant was projected to have a “productive capacity . . . more than 50% greater than that of the Clarksburg factory” (Owens Bottle-Machine Co. 1917). The factory produced pharmaceutical and proprietary medicine bottles as well as milk bottles for the Thatcher Mfg. Co. Thatcher held the exclusive license to make milk containers with the Owens machines, but the Charleston plant manufactured milk bottles for Thatcher until Thatcher acquired sufficient facilities to fill all of its own orders (Toulouse 1971:396)

The new plant drew visitors from throughout the industry. It was the first fully automated factory, where the bottle manufacture from mixing of the batch for the glass to the final inspection at the cold end of the Lehr was untouched by a single human hand. The plant opened with a single furnace but quickly added three others, all in 1918. The company added a fifth furnace the following year. The factory made prescription, proprietary, pharmaceutical, household, chemical, toiletry, and cosmetic bottles, as well as food containers of all types (Toulouse 1971:396-397).

In 1923, the Owens company completed an enlargement of the Charleston factory. The new unit contained “the largest furnace your company has yet built” for two new CA machines, “a new type designed to operate with multiple molds.” The 1923 Owens Annual Report noted that “the completion and installation of the first CA machine is the most important step taken

¹¹ Roller (1994:41) noted that the plant was last listed in a 1923 directory. Since directory listings often continued for several years after a factory closed, we have accepted the Toulouse (1971:396) date of 1921.

¹² The plant was located outside Charleston in the then-unincorporated area of Kanawha City. Consequently it is sometimes called the Kanawha Plant in the trade literature.

during the past year” (*National Glass Budget* 1924:9). The plant remained in production into the Owens-Illinois era (Toulouse 1971:397).

Whitney Glass Works, Glassboro, New Jersey (1835-1915)

Whitney Glass Works (Owens management) (1915-1918)

Plant No. 7 – Owens Bottle-Machine Co. (1918-1919)

Although the company traced its origins to 1775, Thomas H. Whitney did not join the firm until 1835, and the firm became the Whitney Brothers in 1839 (Toulouse 1971:519-522; Tyson 1971:35-36). Whitney received a license for the Owens machines (to make pharmacy bottles) in 1909. This required a significant rebuilding of the plant, with smaller tanks replacing the three larger ones. Owens shipped the first AE machine to Whitney on February 12, 1910, and the factory had seven Owens AE machines in place by the end of 1911 (Miller & McNichol 2002:7; Scoville 1948:110; Toulouse 1971:523).

The plant was a successful operation, but the Owens Bottle-Machine Co. bought the controlling stock in 1915. Lohman (1972:5) explained the sale:

Primarily it was because the Whitney family associated with the enterprise was dying out. . . . The administrators of Dudley Whitney’s estate asked Owens Bottle-Machine Company to take up Whitney’s personal notes in order to prevent the immediate and ill-advised sale of 1,954 shares of Whitney stock. The company complied and three years later Owens Bottle bought the remaining shares and dissolved the Whitney Glass Works on July 1, 1918.

Whitney retained its own identity from 1915 until 1918, when it still boasted seven Owens machines (Owens Bottle-Machine Co. 1917; Scoville 1948:110, 113). Owens began construction of a new plant at Glassboro in 1917 and opened the factory in 1918, the same year Owens acquired the remaining assets of Whitney and dissolved the Whitney Glass Works on July 1 (Lohmann 1972:5-6; Scoville 1948:110). The firm abandoned the old Whitney plant in 1919. The old and new plants apparently coexisted for at least some time, resulting in the name “Glassboro #2” for the second factory. Although we have not discovered documentary evidence to substantiate this claim, it is very likely that the “Glassboro #1” factory became Plant No. 7 in

the Owens lexicon during its brief life as a part of the Owens Bottle-Machine Co. (rather than its old identity as the factory of Whitney).

Plant No. 8 – Owens Bottle-Machine Co., Glassboro, New Jersey (1918-1919)

Plant No. 8 – Owens Bottle Co. (1919-1929)

As noted in the section above, Owens began construction of its new, six-machine plant at Glassboro in 1917. The plant opened in 1918, just in time for the dissolution of the Whitney Glass Works (see above). At that point, the new factory became Plant No. 8 of the Owens Bottle-Machine Co. It made prescription, proprietary, household, chemical, toiletry, and cosmetic bottles (Lohmann 1972:5-6; Toulouse 1971:397; Walbridge 1920:107). The plant remained open and became part of the Owens-Illinois Glass Co. in the 1929 merger.

Charles Boldt Glass Co., Cincinnati, Ohio (1900-1919)

Charles Boldt Glass Co. (Owens management) (1919-ca. 1923)

Plant No. 5 – Owens Bottle Co. (ca. 1923-1926)

In 1900, Charles Boldt reorganized the Muncie Glass Co., Muncie, Indiana, to form the Charles Boldt Glass Co. The same year, he built a new plant at Cincinnati, Ohio. In 1908, the Muncie plant was sold to a newly organized Muncie Glass Co. In the July 10, 1910, and Boldt acquired the right to manufacture liquor bottles on the Owens automatic machine (Lockhart et al. 2007b; Owens-Illinois 1943).

Due to Prohibition, the liquor industry collapsed in 1919, and the Cincinnati plant apparently closed. On November 1, the Owens Bottle Co. purchased the majority stock and took control of the Boldt factories as a subsidiary, refurbishing the plants and converting the machinery to produce a general line of glass products. On November 19, 1922, Boldt offered to sell his remaining stock to the Owens company. Although the date has not been discovered, the Owens firm may have acquired the stock soon after the offer. At some point, probably in early 1923 (but certainly prior to 1925), the Cincinnati factory became Plant No. 5 of the Owens Bottle Co. (the Greenfield plant – formerly Plant No. 5 – had closed in 1921). Owens had certainly acquired the remaining stock by January 1926, when it apparently closed the factory (Lockhart et al. 2007b; Owens Bottle Co. 1920; 1925; Owens-Illinois 1943; 1945:25).

Charles Boldt Glass Co. Huntington, West Virginia (1913-1919)

Charles Boldt Glass Co. (Owens Management) (1919)

Plant No. 2 – Owens Bottle Co. (ca. 1919-1929)

Boldt opened the Huntington, West Virginia, plant in 1913. Until the Owens Bottle Co. captured the majority stock in 1919, the history of the Huntington factory paralleled that of the Cincinnati plant described above. Probably about 1921 (certainly by 1925), Plant No. 2 – formerly, the identification of the West Toledo factory – had been reassigned to the Huntington factory. Huntington remained a part of the Owens Bottle Co., retaining the Plant No. 2 designation with the Owens-Illinois Glass Co. after the 1929 merger (Lockhart et al. 2007b; Owens Bottle Co. 1920; 1925).

Containers and Marks

Owens allowed some companies it purchased to use non-Owens logos and codes. The former Graham plants retained the original Graham marks and code system that included date and factory identifications (see Lockhart 2004; 2006; Porter 1995:4). However, the new management created new marks (but not the Square O) for the American Bottle plants at Streator and Newark (Lockhart et al. 2007a:51-52; Toulouse 1971:454-455). See the Graham and American Bottle sections for more details.

As more and more feeders were developed to make semiautomatic machines fully automatic, the Owens machines fell into disuse. The newer machines were easier to use and made it easier to change molds. The last Owens machine, a 1914 “AQ” Diphead, was retired from Gas City, Indiana, in 1982 (Skrabec 2002:223).

The marks used by the Owens firm can be divided into two distinct periods: Owens Bottle-Machine Co. (1903-1919) and Owens Bottle Co. (1919-1929). During the first period many, perhaps most, Owens bottles were identified by a factory codes, although some apparently had no logos. These may often be confirmed by the distinctive, feathered Owens scar.

For example, in 1911, Owens allowed both the Charles Boldt Glass Co. and the Illinois Glass Co. to have licenses to use the Owens machine to make liquor bottles – and both of those

firms had distinctive logos that they embossed on such containers. These bottles also displayed the Owens scars. However, the Owens firm also licensed two of its own plants, the Northwestern Ohio Bottle Co., Toledo, Ohio (1904-1911), and the Owens West Virginia Bottle Co., Fairmont, West Virginia (1909-1911). Neither of these plants initially used logos on their liquor containers, and liquor bottles with the distinctive Owens scar are frequently found with neither the Boldt nor Illinois Glass markings. These often solarize to an amethyst or purple color, a common characteristic during the first decade of Owens automatic production. For more on the logos and codes used by the Owens plants, see Part 2 of this series.

Discussion and Conclusions

As noted above, the Owens firms were neatly divided into two periods by the names. The Owens Bottle Machine Co. represented the initial period (1903-1919), when the emphasis of the company was on manufacturing, leasing, and licensing the Owens Automatic Bottle Machines. By at least 1905, however, Owens was involved in the manufacture of bottles instead, and that gained increasing importance in the focus of administrators. The reorganization to the Owens Bottle Co. in 1919 was a public recognition of the shift in production from machines to bottles.

During the same period when the attitude converted from licensing to glass production, the firm also moved farther away from exclusive licensing, quickly regretting the permanent loss of business by granting another glass house the sole license to make a specific bottle type – thereby excluding the Owens firm, itself, from using its own machines to manufacture the same product. To counteract this initial indiscretion, Owens began acquiring competitors in order to gain either their Owens licenses (e.g., the beer and soda bottle capacity with the purchase of the American Bottle Co.) or their other machine inventions (e.g., the Graham machines with the acquisition of the Graham Glass Co.). The Owens Bottle Co. became a giant and grew even larger when it merged with the Illinois Glass Co. in 1929 to form the megafirm, the Owens-Illinois Glass Co.

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