The Dating Game: Thatcher Glass Mfg. Co.

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History

H.D. Thatcher & Co. (1883 to at least 1894)

Dr. Hervey D. Thatcher, a Potsdam, New York, druggist, is frequently described as the father of the milk bottle. Evidently a practical chemist as well as an inventor, he developed Thatcher's Orange Butter Color[1] in 1881, which he sold from his drug store – an operation that paid particular attention to supplying the dairy trade (Thatcher 1883). What made his lasting reputation, however, was a series of inventions intended to bring sanitary practices to the milk industry. Thatcher himself did not invent the first milk bottle, or even the first "modern" milk bottle. Nor did he ever manufacture glass. But he put the first Common-Sense milk bottle on the market, and the company that he founded became the most important milk bottle manufacturer of the 20th century.

Prior to the invention of the milk bottle, dairy wagons delivered "loose" milk in large, metal containers. At each stop, the milkman would use a dipper to transfer milk from the cans to the housewife's pitcher. In many parts of the U.S., this method of delivery continued into the 20th century. According to a local legend, Thatcher became interested in sanitary conditions in the milk trade when he "observ[ed] a little girl drop a soiled rag doll into an open ten gallon container of milk that a milkman was using to deliver milk door to door" (Gallagher and Munsey 1969:332). A more prosaic recollection is provided by Thatcher himself. In a letter written on July 1, 1919, he recalled a conversation, years earlier, with a local dairyman:

> He said when he started to deliver milk in the morning, the cream would rise to the top (the dip can) so that the first served got a surplus of cream, and as he each time removed the cover, some dirt from the street, some hair from the horses would each time sift into the milk, so that when he reached the last customers, they were served skim milk with all kinds of foreign matter that had sifted in while on his route (Thatcher, in Rawlinson 1969:19).

Thatcher's first effort toward milk sanitation was the "Milk Protector," a covered milk pail with two sleeve funnels in which the teats were inserted during milking, thus preventing hair, dirt and insects from contaminating the milk (Thatcher 1883; **Figure 1**). He called this invention the Thatcher Milk Protector, and patented it in 1883. He then turned his attention to a method of getting the milk from the barn to the consumer without it being contaminated in the process.

Although the first patented milk bottle appeared in 1875,[2] it was not until Thatcher invented a milk jar – soon vastly improved by his associates – that the delivery of bottled milk became practical (Gallagher & Munsey 1969:332; Scharnowske 1998:6; Tutton 1994:2-3, 6). Thatcher's container became so popular that he was called the father of the milk bottle, and the container was embossed "THATCHER MILK PROTECTOR" on the front **[Figure 2]**. Although this embossing may actually have referred to the pail, the bottle became accepted by that name. By 1885, Thatcher was advertising his milk protector as "the ONLY PLAN KNOWN that secures to the consumer ABSOLUTELY PURE MILK in such manner that it can be kept sweet for several days, furnish a good coat of cream and is handy to use. . . . THE SEALED BOTTLES are easy for the patron to store as they can be kept in a refrigerator without imbibing its odor" (Tutton 1994:8).[3]

In his 1919 letter, Thatcher noted that he "turned with my own hands at the lathe a wooden mould, including the wood stopper, for the [Milk Protector] milk bottles" and got it through the patent process in Washington, D.C.[4] He

Fig. 2

Figure 1

personally took the wooden prototype to the Whitall Tatum factory at Millville, New Jersey "and asked them to get out the goods." Thatcher took some bottles home with him and ordered "a quantity" of them to be delivered (Thatcher, in Rawlinson 1969:18-19).

The Milk Protector was originally sealed by a Lightning-style fastener that held a metal lid in place by a wire arrangement that allowed the lid to be tilted off the top of the bottle and replaced to re-secure the seal. Thatcher and his partner, Harvey P. Barnhart, also patented a simplified wire and metal arrangement with a domed glass lid on April 27, 1886 (Patent #340,833; **Figure 3**). These were apparently used on subsequent versions of the Milk Protector.

Gallagher (1969:50) suggested that Thatcher patented the "common sense milk jar," which used the cap seat and ligneous disks as a seal, on September 17, 1889. In fact, the actual patent (411,368) for the ligneous disk sealer was registered by his associates, Harvey P. Barnhart and Samuel L. Barnhart **[Figure 4]**.[5] The Barnharts noted that their invention was intended for:

> bottles used by milk dealers in delivering milk to consumers, the bottles being left with the consumer and returned to the dealer after the contents have been used, the bottle being thus of necessity repeatedly washed and refilled. To this end it must be capable of easy filling and emptying and devised particularly with a view to ease and certainty of thorough cleansing (Patent 411,368).

The inventors thoroughly discredited the metal and glass lids in use at the time and suggested that their invention would solve the inherent cleaning problems with the earlier closures **[Figure 5]**. They suggested instead a "thin wafer-like disk or cap" that would seal on "an offset or shoulder . . . to form a seat for the disk" inside the neck of the bottle **[Figure 6]**. The "ligneous disk" was to be made from "clean tasteless inodorous white soft wood" that was "then immersed in boiling paraffin to thoroughly impregnate the grain" (Patent 411,368). By at least 1895, Thatcher advertised these bottles as the "Common-Sense Milk Bottle" (*Cultivator and Country Gentleman* 1895), although that term was not included on the patent document.

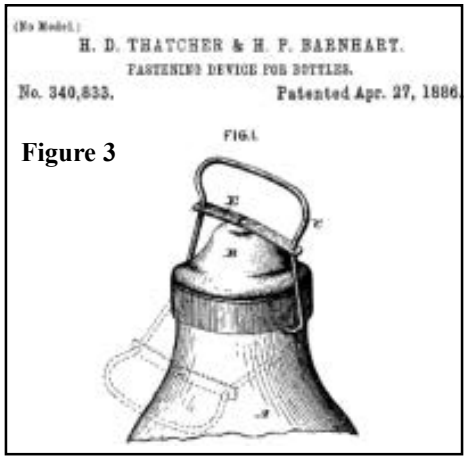

H. D. THATCHER & H. P. BARNHART.
FASTENING DEVICE FOR BOTTLES.
No. 340,833. Patented Apr. 27, 1886.
FIG. 1.

Figure 3

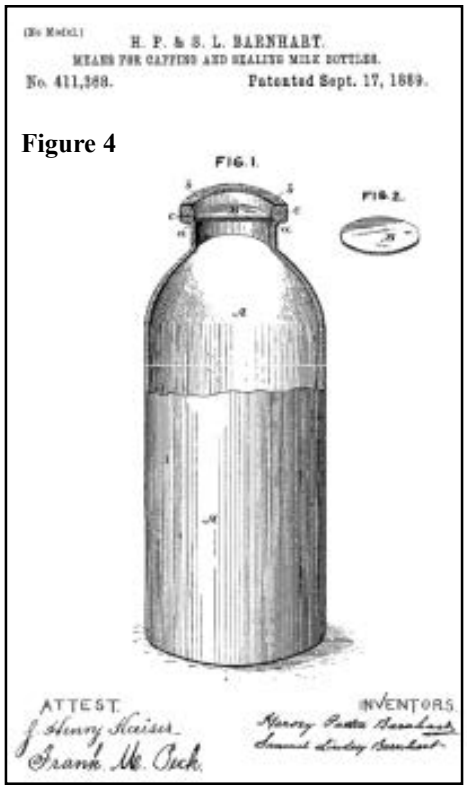

H. P. & S. L. BARNHART.
MEANS FOR CAPPING AND SEALING MILK BOTTLES.
No. 411,368. Patented Sept. 17, 1889.
FIG. 1. FIG. 2.
ATTEST.
INVENTORS.

Figure 4

^ **Figure 5**

Figure 6 >

According to Scharnowske (1998:1), the initial company was called H.D. Thatcher & Co., in business from 1883 to ca. 1885. Milk jars were only marketed to a single dealer in each town and only then if the dairy also bought the Thatcher Milk Protector (pails). Although a new corporation began ca. 1889 (see below) H.D. Thatcher & Co. actually continued to operate in some form. The company registered trademark 24,338 on March 13, 1894. The actual termination date for the company is currently unknown.

Thatcher Mfg. Co. (ca. 1889-1946)

Thatcher incorporated the Thatcher Manufacturing Co., a New York corporation in 1889 (Moody 1921:615). The corporation was evidently created to manufacture milk bottle caps and other Thatcher products, especially Orange Butter Color, which it did for two decades (*Hoard's Dairyman* 1908). It also sold the milk bottles, which were actually manufactured for Thatcher by Whitall Tatum & Co., Millville, New Jersey (Rawlinson 1970:19, 22). The future, however, lay entirely with the milk bottles, and it was not Dr. Thatcher who was to take the company in that direction.

At the turn of the century, control of the corporation was purchased by Francis E. Baldwin and a group of investors.[6] Baldwin – in prior business life, a lawyer – took direct control in 1902, and soon turned the floundering company into an efficient and profitable operation. In June, 1903, Baldwin heard about the Owens automatic bottle machine and determined to investigate it as the means of producing milk bottles directly. A few months later, he saw the machine in operation at Toledo. He was so impressed that he closed a contract for the exclusive use of the machine for milk bottles. The contract required liberal financing and it was not until a year later, or in September, 1904, that he had sufficient funds for a factory and to pay the Owens people as well. A factory building was at once erected in Kane, Pennsylvania. (Glass Container 1927:38).

The Kane operation was variously listed as the Kane Milk Bottle Co. or the Baldwin-Travis Glass Co. In any case, the plant was intended – at least initially – as a separate entity that would manufacture bottles to be distributed by Thatcher. The reason was clearly that the Thatcher stockholders were leery of the huge capital investment

necessary, so hard on the heels of the company's new-found stability (*National Glass Budget* 1904; American Glass Review 1934:167). The principals were Baldwin and H. E. Travis, and it was as Baldwin-Travis that the company secured the license from Owens on September 16, 1904:

> It seems that a Francis E. Baldwin, who was both the president and treasurer of Thatcher, had intended that Baldwin-Travis . . . would make the bottles which Thatcher would sell. As the National Glass Budget predicted on November 19, 1904, the two companies soon combined under the Thatcher name. H. E. Travis, with whom Baldwin had associated to obtain the Owens license, was a practical glass manufacturer who had been superintendent at the Fidelity Glass Company in 1903 and who later established his own plant and made milk bottles by hand process (Scoville 1948:104-105).[7]

If it was intended that Travis' experience as a practical glass maker would ensure the successful inauguration of the new factory, that proved not to be the case. The installation was plagued with problems from the outset. According to J. A. Arrandale, a longtime Thatcher employee, "The first year of their glass making experience was somewhat of a nightmare. It was almost a complete failure. They had made virtually millions of bottles, none of which were commercial" (Arrandale, in Rawlinson 1969:22-23).

The Owens machine was a new technology, being tried on a new type of bottle for the first time, and no one had the understanding to bring the machines into effective production. It was only when Baldwin hired R. W. Niver, a young engineer, that the company was able to begin successful operation. It is not altogether clear when this occurred, but since they were not yet in production in March, 1905, the earliest possible date for the beginning of commercial bottle manufacture by Thatcher would be later in that year (Rawlinson 1969:22-23; *National Glass Budget* 1905).

Thatcher stressed the quality of what the ads called "the Thatcher method" (actually improvements created by the Owens machine). The ads noted structural improvements, especially "uniform thickness" of the glass, claiming that a Thatcher bottle "breaks less readliy than the ordinary milk bottles." The ads also stressed the "accurate capacity" of Thatcher bottles, a leap in quality that handmade bottles simply could not match (e.g., *Milk Dealer* 1912; **Figure 7**).

Meanwhile, Baldwin had already moved to merge the Baldwin-Travis operation with Thatcher. Not surprisingly, the union was opposed by some of the Thatcher shareholders, who unsuccessfully sought an injunction to block the merger. It is notable that Thatcher at that time was capitalized at $50,000 and Baldwin-Travis at $1,500,000 (*Syracuse Herald* 1905). Given the problems with the Owens machines, the investors' concerns were predictable. But with success at Kane, Thatcher entered a new and successful era.

Thatcher expanded in 1908, building a second plant at Ottawa, Illinois, but it soon moved to Streator, Illinois, because of a nearby fuel source. In 1912, a third plant was opened at Elmira, New York, where the main office had been moved at the end of 1904 (Toulouse 1971:496-498; *National Glass Budget* 1904).

In 1909, the "Thatcher-Baldwin Co." was listed as having four Owens machines, all in Kane, Pennsylvania. The Kane plant still

operated four machines in 1910, and Streator had two. In addition, four new Owens machines were to go to a new Thatcher plant in New Jersey the next year, but these were apparently deferred to the Elmira plant. By 1913, Thatcher was listed as manufacturing "fruit jars and milk"[8] bottles using the Owens machine and six continuous tanks. The following year the Elmira, Streator and Kane plants were each listed as having four machines, all making "milk jars." The most detailed inventory of Thatcher's Owens machines is from late 1916, when Kane and Streator each had four 6-arm machines, while Elmira had four 6-arm and two 10-arm machines (Hayes 1909:1; *National Glass Budget* 1910a:1; *Journal of Industrial and Engineering Chemistry* 1913:954; 1914:864; *Milk Dealer* 1916; Palmer et al. 1917:213).

The largest expansion in Thatcher history occurred in 1920, when Baldwin negotiated the purchase of four rival companies: Essex Glass Co. (factories at Dunkirk, New York, Mt. Vernon, Ohio and Parkersburg, West Virginia), Travis Glass Co. (Cedar Grove and Clarksburg, West Virginia), Lockport Glass Co. (Lockport, New York), the Woodbury Glass Co. (Winchester, Indiana), and the milk bottle business and Hartford-Fairmont (later Hartford-Empire) machine and license of J. T. & A. Hamilton Co. of Pittsburgh. Although the deal allowed Thatcher to take over much of its competition, the real objective was to acquire exclusive rights to the new Hartford-Empire machines for milk bottles, then held by the acquired companies. To arrange for the $3,000,000 acquisition, Baldwin negotiated substantial loans from E. D. Libby and other investors. He then took Thatcher public, offering $2,000,000 worth of bonds to cover the purchases (Moody 1921:615; 1924:1010; *Glass Container* 1927:42, 44; *New York*

Times 1920).

Thatcher was clearly in transition from relying on Owens machines to the more user-friendly press-and-blow machines. Soon, the Owens machines were no longer used for milk bottle manufacture. Empirical evidence suggests that Owens machines were mostly eliminated by 1925, the last date code we have found on an Owens-made bottle with a Thatcher logo.

The dramatic 1920 expansion, however, attracted the attention of the Federal Trade Commission, and it began an investigation of the transactions. In 1923, it held that the stock transfers involved (the basis for the acquisitions) were conducted to materially reduce competition and were thus unlawfully acquired. Thatcher was therefore ordered to divest itself of the Essex, Lockport, Travis and Woodbury properties. Thatcher appealed this ruling to the district court, but lost. Thatcher then appealed to the Supreme Court, which in 1926 ruled that while the stock was illegally acquired, the FTC had no authority to order the company to divest itself of material property. The divestment order was consequently moot (272 U.S. 554; *Yale Law Review* 1934).

Thatcher meanwhile had closed the Kane, Mt. Vernon, Clarksburg and Winchester factories between 1923 and 1926. The company later closed the Parkersburg and Dunkirk plants, but in 1933 it acquired the Peerless Glass Co. with a factory in Long Island City, New York (Toulouse 1971).

For bottle collectors, probably the most interesting development of the 1930s was the introduction of applied color labels. This labeling technique – called "pyroglazing" by Thatcher – was reportedly "demonstrated" by the company in 1932 **[Figure 8]**. Their first ads for the process, and presumably it's first appearance on their bottles, was in March, 1934 (*Food Industries* 1935:117; *Milk Dealer* 1934; *Milk Plant Monthly* 1934).

The most significant development for the company in this era, however, followed from its 1935 acquisition of the capital stock of the Olean Glass Co., Olean, New York. Thatcher control of this plant initially seemed of little note, since the company announced that the Olean operation would continue to manufacture "containers for beer, carbonated beverages, cider, foodstuffs, oils, polishes, proprietary medicines and vinegars" (*Glass Packer* 1935:574). This opened up an entirely new venue for Thatcher. However, the Olean plant retained its own identity until Thatcher acquired complete ownership in 1943. Olean became a division of Thatcher effective Jan. 1, 1944 (*Olean Times Herald* 1943; *Wall Street Journal* 1944).

Thatcher's acquisition of Olean was part of a plan to diversify the company, long dependent on milk bottles as its only product. Franklin B. Pollack was a man of vision in the Thatcher hierarchy. Along with some associates, Pollack began buying Thatcher stock in 1943, until his group had acquired a working control of the firm (20% of the stock). At that point, they began revising the Thatcher procedure to diversify (Abele 1960). Thatcher began advertising non-milk bottles in 1944 (*Food Packer* 1944:57).

As part of a revamping of the Olean plant in 1944, Thatcher installed "equipment for the manufacture of amber beer bottles" (Gingold 1945:11; **Figure 9**). By the end of the first year, Thatcher had "turned out millions of beer bottles including Steinies, Export and One-Ways, the new single trip bottle." The company even planned to renovate part of its Streator, Illinois, factory for beer bottle manufacture.

Thatcher Glass Mfg. Co. (1946-1966)

The company changed its name to Thatcher Glass Manufacturing Co. Inc. in 1946 (*Wall Street Journal* 1946). The company moved its corporate headquarters from Elmira to New York City in 1957. By

Figure 8

Figure 9

1960, Thatcher became one of the driving forces behind the push toward non-returnable bottle use in the soft drink industry, and it ranked 5th in the glass container industry – behind Owens-Illinois, Hazel-Atlas, Anchor-Hocking, and Brockway (Abele 1960).

Thatcher Glass Mfg. Co. (1966-1981)
Thatcher Glass Corp. (1981-1985)

In 1966 Thatcher was acquired by Rexall Drug & Chemical Co. (later Dart Industries, then Dart & Kraft Inc.), of which it became a division. It was sold in 1981 to Dominick & Dominick (*Wall Street Journal* 1966; 1981). Thereafter it operated as the Thatcher Glass Corp.

Thatcher declared bankruptcy at the end of 1985, and Diamond-Bathurst, Inc. acquired its remaining assets (Barlett & Steele 1992; Owen-Illinois 2001).

Bottles & Marks

H.D.T. & CO. POTSDAM, N.Y. (1884-1889)

This mark was embossed in a plate mold on the reverse side of one of the early Thatcher Milk Protector bottles. Although these early bottles were made by Whitall Tatum & Co., Thatcher's initials were included from ca. 1883 to ca. 1885 (Scharnowske 1998:1; Tutton [1997]:6). Potsdam, New York, was Thatcher's earliest location and was not a glass factory.

We feel a date range of ca. 1884 to 1889 is more likely. Thatcher's letter (discussed above) implied that he took his prototype bottle to Whitall-Tatum in 1884, making that the earliest possible year of production. In 1889, the bottle section of the business transferred to the Thatcher Mfg. Co.

THE THATCHER MANUFACTURING COMPANY (1905-1909)

Knipp (1990:4) showed a rubbing of this mark from a bottle in his collection. He stated that he believed the bottle to have been made "c. 1905, early in the Thatcher manufacturing history, by virtue of their being machine made with very shallow cap seats and tin tops." The mark consisted of "THE THATCHER MANUFACTURING" in an arch and "COMPANY" in an inverted arch, to form a complete circle around the edge of the base **[Figure 10]**. The bottle was almost certainly made during the pre-date-code era of Thatcher machine manufacture: 1905-1909.

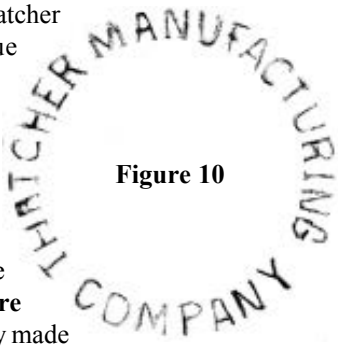


Figure 10

THATCHER MF'G CO. (1905-1909)

A milk bottle offered on an eBay auction was embossed on the base THATCHER MF'G CO. (arch) / 7 / {illegible two-digit code}. An obvious Owens scar encircled the base of the letters **[Figure 11]**. Although we currently know little about the mark, it was used during the Owens machine period of Thatcher. Since the lower two digits are illegible, we cannot tell if they were date codes. However, the marking is similar to one discussed below that was embossed with an "8" in the center and may be from the same era. It is even possible that the "7" and "8s" are early Thatcher date codes for 1907 and 1908. This mark was probably used between 1905 and 1909.

Figure 11

THATCHER MF'G CO. POTSDAM, N.Y. (1889-1905)

According to Giarde (1980:112-114), this mark was used "possibly 1880's-1890's." This would indicate bottles made for Thatcher by Whitall Tatum & Co.; Thatcher did not actually manufacture bottles until 1905. Giarde (1980:116) noted that dating Thatcher bottles was "an extremely inexact undertaking on bottles made before 1920" and admitted that he had made "no visual confirmation" of this mark.

Scharnowske (1998:1-2), however, noted the use of the mark (always with POTSDAM, N.Y.) on at least three variations of the Thatcher Milk Protector in both quart and pint sizes. Some of these were also marked PAT. SEPT. 17, 1889, or with abbreviations for the year (on Common Sense milk bottles). Scharnowske dated the bottles without the patent date from 1885 to 1889. Although he offered no date range for the later bottles, all we have seen were mouth blown, thereby predating 1906.

T.M'F'G.Co. (ca. 1890-1919)

Giarde (1980:112) dated this mark from the 1890s to ca. 1917. As mentioned above, these early marks are difficult to date. However, Giarde (1980:117) also stated that most bottles fit into

the 1889-1914 period, but dated bottles are as late as 1919. The only Thatcher ad we have seen that mentions this mark is from October 1916. It refers to "Milk bottles with the 'T.Mfg.Co.' on the bottom" (*Milk Dealer* 1916b). Note that this logo has a large temporal overlap with the next mark below. All T.'F'G.Co. marks are found on bottle bases.

This mark appeared in three configurations that we can confirm:

1. T. M'F'G Co. (arch) / PAT. SEPT. 17TH 1889 (inverted arch) – mouth-blown bottles; the "o" in "Co" can be either capital or lower case **[Figure 12]**

2. T. M'F'G Co. PAT. SEPT. 17TH 1889 in a complete circle around the outside edge of the base – mouth-blown bottles; lower case "o" in "Co"

3. T. M'F'G CO horizontally across the base – Owens scar **[Figure 13]**

Date codes accompany most but not all of the #3 configuration. In all cases we have observed or have seen reported, the date code is embossed below the logo. Since the Owens scar sometimes distorted the logo, it is frequently difficult to distinguish this mark from the one without the apostrophes (discussed below). The authors have seen date codes accompanying the horizontal variation (#3) of this mark ranging from "10" (1910) to "18" (1918), although these, too, were often distorted by the Owens scar. Giarde added a reported date code of "19" (1919).

T.MFG.Co. (ca. 1900-1925)

According to Giarde (1980:112), this mark was used from ca. 1910 to 1924. This form and the T M'F'G.Co. logo described above are very similar and are frequently difficult to distinguish because of weak strikes of the mark and/or distortion because of the Owens scars. Although this is not obvious from his text, Giarde's dating is primarily based on date codes. This mark is found in at least three configurations.

1. T.MFG.CO. (arch) / S / PAT. SEPT. 17TH 1889 (inverted arch) on an apparently mouth-blown bottle (eBay; **Figure 14**)

2. T.MFG.CO. (inverted arch) with "8" in the center, Owens scar. (eBay; **Figure 15**)

3. T.MFG.CO. embossed horizontally across the center of the base with Owens scar **[Figure 16]**

Certainly, the mouth-blown bottles were made prior to the Owens production by the Kane plant in 1905. The inverted arch variation with an "8" in the center was probably used during the 1905-1909 period, and the "8" may even have been a date code for 1908. Another bottle with a similar or identical mark was described on eBay.

Although we have only seen date codes placed below the logo on the Owens-scarred bottles, sellers on eBay have reported date codes above the logo. Reported and observed date codes range from 1911 to 1925 (the latter bottle in the collection of one of the authors). One bottle listed on eBay was embossed 17 above the logo and 11 below it.

Albert Morin (personal communication 2/19/2007) has a milk bottle embossed "T MFG CO" with date code of "09." Another milk bottle in his collection has an acid-etched Massachusetts seal date coded "1908" along with the "T MFG CO" mark on the base but no accompanying Thatcher date code. This makes 1909 the year of probable adoption for date codes, likely late in the year. The totaled information suggests a use range of date-coded marks from 1909 to 1925. However, the use of the mark on at least one mouth-blown bottle suggests that the mark was first used prior to the adoption of Owens machine. Since mouth-blown bottles with the mark are unusual, they were probably only used for a short time prior to machine adoption. We have selected an arbitrary date of ca. 1900 for the probable earliest use on mouth-blown bottles.

TMC (1920-1924)

Giarde (1980:112) dated this mark in the early 1920s. Because of inconsistent date code usage, the TMC marks are sometimes difficult to date, but this was the most common mark used from ca. 1920-1923. All examples of this mark that we have observed lacked punctuation. The logo was embossed variously on the front heel, back heel, base, or both heelmark and basemark on the same bottle **[Figures 17 and 18]**. Although numbers that cannot be date codes (e.g., 11 or 63) appear in

Figure 12

Fig. 13


Figure 14


Figure 15

Figure 16

Fig 17 >

Fig. 18

conjunction with the mark, we have also recorded date codes of 21-24. Although most the bottles reported were machine made with ejection (valve) marks on the bases, we have observed two with the TMC logo and an Owens scar, both on the base. Although most Thatcher ads of this period depict bottles without showing the marks, an exception occurred in October, 1922, when a bottle was illustrated with this mark on the front heel (*Milk Dealer* 1922).

Ejection or valve scars (also frequently called marks) are found on the base of bottles made by the press-and-blow method. In this method, the first step entails the dropping of a gob of glass into the parison mold and pressing it with a plunger to form the finish of the bottle as well as creating a hollow to allow the second stage to work. The parison is ejected from the mold by a valve or ejection rod, which leaves a small circular scar on the base of the completed milk bottle. The second stage moves the parison to the final mold where compressed air blows the bottle into its completed shape.

To alleviate any doubts that this was an intermediate mark, it appeared in conjunction with the mark that preceded it. On one bottle, the TMC logo was embossed on the heel with T MFG CO. / 21 on the base. The T MFG CO. logo was still in use until 1925 (see above), although it was being phased out in favor of the TMC mark. This combined mark suggests, however, that the TMC logo was in use by 1921. In 1923, the TMC mark was used along with the MTC logo that was adopted at the end of the TMC mark usage (Giarde 1980:117). With a single exception, the TMC mark appeared horizontally on all logos we have seen. The exception was in an inverted arch on a base we observed.

This sort of mark mixing was not unusual. Molds were made in three parts (not including the finish, which could consist of multiple parts): two side pieces and a baseplate. Since the bottles were made to uniform dimensions (at least where the baseplate joined the side pieces), each part of the mold was used until it wore out. Occasionally, a baseplate with an old logo would still be used, often in conjunction with a newer mark on another part of the bottle – after the older logo had discontinued.

This timing fits perfectly with Thatcher's acquisition of several former competitors in 1920. Since part of the reason for the massive purchases was to acquire the use of the press-and-blow machines, the appearance of the TMC mark on press-and-blow bottles at this time is one of the most intuitive changes we have found.

Some of the TMC marks are embossed on the heels of bottles that have Massachusetts "E" and "L" shoulder seals. Along with the "T" seal for Massachusetts, Thatcher also used the "L" and "E" seals after the acquisition of Lockport and Essex in 1920 (Brad Blodgett, personal communication 1/25/2007). These were probably only used until the molds for them wore out, although Thatcher certainly acquired rights to the logos along with the companies.

TMCo or TMC Co

Although this mark was not recorded by Giarde, and we have not seen an example, it was reported on two different eBay auctions. In one case, a seller described a bottle with T M C on the back heel and T M Co. 22 on the base. Another seller reported a mark of TMC 11 on the heel and TMC Co on the base. Although both of these are probably mistaken readings, either or both could be engravers' errors.

MTC [rectangular] (1923-1949+)

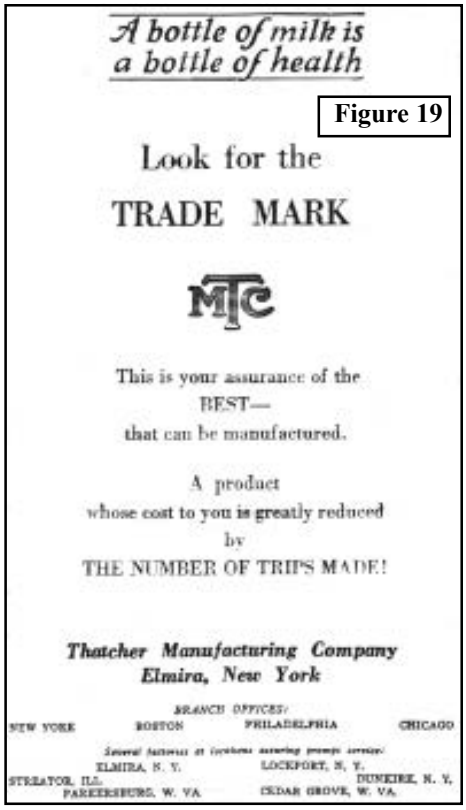
Giarde (1980:112, 116-117) dated this mark 1923-1949. This was the first mark with what he called regular usage and was the dominant mark from 1923 to 1949, although it has been found on bottles up to at least 1954 **[Figures 19 and 20]**. Beginning in 1923, the date code may be inside the ejection (valve) mark, often with a letter between the two numbers. About 1935, the date code moved outside the ejection mark on the base. On some bottles, other numbers are embossed on the heels, but these are not date codes. Specifically, a heelcode of 1-11-14 is *not* a date code.

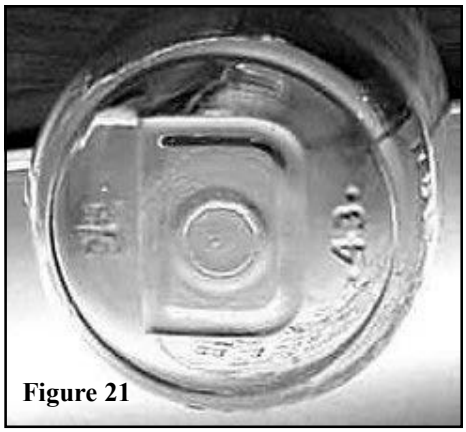
The MTC logos were most often embossed on the heels of milk bottles, and they are illustrated in that location in Thatcher ads beginning in September, 1923 (*Milk Dealer* 1923). Theese logos were sometimes placed on bases. We have encountered a single example with the logo embossed on both heel and base. Date codes **[Figure 21]** and plant codes (see Plant Code section below) were almost always embossed on bottle bases, but they were placed in a complex variety of configurations. The earliest date codes we have encountered were inside the ejection marks. These were sometimes joined by plant codes, also inside the ejection marks. The date/plant code combination was embossed in five patterns:

1. Date code split around plant code inside ejection mark (range 3E0 to 3E7)

2. Date code following plant code inside ejection mark (range D24 to L37)

3. Date code inside ejection mark; plant code outside





4. Plant code inside ejection mark; date code outside

5. Date and plant code both outside the ejection mark (could be any location on base)

Sellers on eBay have reported date codes in conjunction with the MTC logo as early as "24" and "25" – both within an ejection mark on the base in the #2 configuration. The earliest split date code we have encountered was "3E0" and "3D0" (see ranges above). Date codes outside the ejection marks range from at least "26" to at least "47" with a single outlier recorded as "51."

With a single exception, all of the bottles marked with the MTC logo were made by press-and-blow machines (leaving ejection or valve marks). A single bottle was reported on eBay with MTC-S11 embossed on the heel and an Owens scar on the base.

(1944-1985)

According to Giarde (1980:112, 117), this mark was used from 1949 until his book was published in 1980. This is the only mark noted by Toulouse (1971:496), and his illustration did not show the serifs. He dated the mark "1900 to date" (i.e., 1971). Giarde's information was obviously researched in much greater depth. However, neither author was entirely correct.

The serif mark is clearly shown in 1944 ads for Thatcher's new line of packers' ware (food bottles) and beer bottles (*Food Packer* 1944; *Modern Brewery Age* 1944) and almost certainly represents the Thatcher entry into new product lines that year (**Figure 22** – also see Figure 9). The earliest date code we have observed for the mark was "54," although our sample for this newer mark is small. Hanlon (1971:6-17) illustrated an example of this mark in his 1971 chart. It remained listed in 1982 (Emhart 1982:75). The mark was certainly used until Thatcher closed in 1985.

Figure 22

MTC in a triangular outline

According to Giarde (1980:119-120), "The Thatcher mark used after 1923 has been found within a triangle on a one ounce coffee creamer (Rochester Dairy). Use of the surrounding triangle is an oddity for Thatcher." We have not seen this anomalous mark.

T in the Massachusetts Seal

Beginning in December 1900, the Commonwealth of Massachusetts instituted a "seal" law to regulate the capacity of milk bottles. Initially, local jurisdictions etched the seals on individual bottles, noting that each bottle met the standards. In 1909, Massachusetts required that all glass factories selling bottles to dairies within the state mark their containers with a Massachusetts seal. The seals took various forms, and the mark used by Thatcher was "T" (Blodget 2006:8; Schadlich & Schadlich 1984; Schadlich ca. 1990).

The earliest seals, beginning in 1909, were in the form of a slight arch above the front plate mold, embossed "MASS SEAL T." By at least 1911, a configuration with the same wording was embossed horizontally across the upper back body – although the arched variation may have also continued in use. The final shape, "MASS / T / SEAL" in a circular format, was in use by at least 1914, although Massachusetts law did not require that specific configuration until 1918.

As Thatcher bought other milk bottle manufacturers, it continued to use their seals until the existing molds wore out. This is notable on a bottle in the Morin collection with the "MASS / L / SEAL" embossed on the shoulder **[Figure 23]** and the TMC mark of Thatcher appearing on the heel. By 1924, however, the transition appears to be complete. It is also probable that Thatcher used both the seals and marks of the former companies while filling existing orders, probably only during the first year of transition. Most (possibly all) Thatcher milk bottles with Massachusetts seals were made in either the Elmira or Lockport plants, both located in New York.


Figure 23

K9, K-9, or K.9 (ca. 1928-late 1930s)

These marks are found on bottles, both with or without a Thatcher mark. These bottles lack date codes, although Giarde (1980:118-119) suggested a date range from the 1920s to the late 1930s. Giarde attempted to explain the marks but finally concluded, "In the final analysis it can only be said that K9 milk bottles should be attributed to Thatcher. Beyond that the K9 will remain a mystery until some researcher finds the answer."

A complicating piece of evidence is the listing of the mark as belonging to the Knox Glass Bottle Co. in the 1928 Massachusetts Bulletin (Schadlich and Schadlich 1989). Blodget (2006:8) also identified "K9" in the Massachusetts seal as the mark identifying the Knox Glass Bottle Co. The earliest listing we have found for milk bottle production by Knox was 1930 (American Glass Review 1930:91).

The resolution of these apparently conflicting lines of evidence is fairly simple. In December, 1932, Thatcher "purchased bottle machines, molds and name-plates, certain Hartford Empire licenses relating to the manufacture and sale of milk bottles, and good-will, etc., of Knox Glass Bottle Co., of Knox, Pa." (Porter 1935:1518). Bottles exhibiting both the K9 designation and a Thatcher mark were clearly made by Thatcher after 1932 **[Figure 24]**. Bottles with an embossed K9 but lacking any Thatcher mark were presumably made by Knox before the Thatcher purchase.

Figure 24

The "K" in the mark obviously indicated Knox, but the number "9" is less obvious. Although this line of inquiry has yet to be fully researched, about 1910, a national numbering system for milk bottle manufacturers was set in place. This was

probably not an official national government notation, but it was used consistently by virtually all milk bottle manufacturers. The number "1," for example, was assigned to the Lockport Glass Co. and was consistently used by that company in conjunction with the LGCo mark. Fidelity Glass Co. marked its bottles FG2 until the Atlantic Bottle Co. purchased the company and began using a mark of ABC2. This system continued in sequential order to at least 52 (the L52 mark used by Lamb Glass Co.). The number assigned to Knox was "9."

Figure 25

These marks are found in at least three locations and configurations on milk bottles. As discussed above, "K9" is found on Massachusetts shoulder seals only in the "MASS / K9 / SEAL" format, a configuration officially adopted in 1918, although it was used by at least 1914. The mark is also embossed on the heels of milk bottles, with and without the Massachusetts seal. A more unusual configuration is "SEALED / K9" in a plate mold on the shoulder **[Figure 25]**. We have not discovered a specific reason for this usage.

Other "Seals" and Required Marks

Maine also had a seal requirement that used numerical codes instead of initials. Thatcher was awarded code #1. The Maine seal, like those discussed above for Massachusetts, was usually embossed on the shoulder and could be in a plate mold. The configuration for Thatcher was "MAINE (arch) / 1 / SEAL (inverted arch)." In one very unusual format, it was found in red pyroglaze on the shoulder of a square milk bottle in the same format, except that "MAINE" and "SEAL" were both horizontal **[Figure 26]**. An embossed MAINE K9 SEAL also exists **[Figure 27]**.

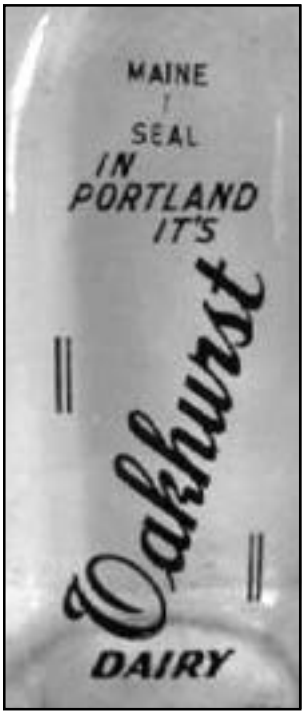


Figure 26

Figure 27

Rhode Island also used the seal system, but we have found very little information about those bottles. One eBay seller reported a bottle embossed "R.I. / 11 / SEAL," but we have not been able to verify this. Schadlich and Schadlich (1989), however, identified the number "11" with Thatcher. Giarde (1980:146) also noted that the heelmark "REGISTERED SEALED 1-11-14" was commonly associated with Thatcher marks. Morin (personal communication 3/3/2007) hypothesized that the number combination was derived from numerals used by the various glass plants acquired by Thatcher in 1920. Lockport Glass Co. universally embossed a "1" beneath its "LGCo" heelmark; Thatcher was identified by "11"; and "14" was associated with J. T. & A. Hamilton milk bottles.

Wisconsin also required codes, although we do not currently know where the information was embossed on the bottle. Thatcher also received the #1 code from Wisconsin (*Stevens Point Journal* 1913:1). Minnesota used a different design for seals: a triangle in two sections with the identifying code number under the apex with "minn" in the lower section separated by a line. Again, the Thatcher number was "1" **[Figure 28]**. The triangles were originally placed on the shoulder but eventually migrated to the heel. In the Pennsylvania system, shoulder seals for Thatcher bottles took the circular form of SEALED (arch)/ 11 / PA (inverted arch). Central numbers of both "11" and "1" have been identified in eBay photos, and the heel mark "REGISTERED SEALED 11PA1" was noted by Giarde (1980:146) and recorded as a heelmark on eBay.


Figure 28

T in an inverted triangle

This mark has sometimes been attributed to Thatcher (Snyder 2006:13). Giarde (1980:123-125) discussed four possible contenders, proposed by collectors as the user of the Inverted-Triangle-T mark. A key issue in his discussions is that the Inverted-Triangle-T mark is known to have been accompanied by a "TR" in the Massachusetts seal. Giarde (1980:124), however, stated, "There is not the slightest shred of evidence supporting such a conclusion. In other contexts (e.g., Schadlich & Schadlich 1984) and in ads, the Inverted-Triangle-T mark is solidly identified with the Travis Glass Co.

Plant Codes

Often, milk bottles made by Thatcher during the ca. 1923-1947 period (bearing the non-serif MTC mark) were embossed on the base along with a single large letter that covers most of the base. These large initials represent the dairies or creameries that actually used the milk bottle; they are not related to manufacturer's marks or plant codes. In addition, numerous milk bottles have been observed embossed on the bases with smaller, single letters. Although these smaller letters may be embossed anywhere on the bases (including within the ejection mark – with or without a date code), with a very few exceptions, they fall into predictable patterns.

We repeatedly see the letters "D," "E," "L," and "S" embossed either near date codes or on some other part of the base **[Figures 29 and 30]**. Schadlich ([ca. 1990]) suggested that these letters are plant codes for Dunkirk, New York; Elmira, New York; Lockport, New York, and Streator, Illinois. Although we have not seen a bottle with the mark on the base, Shadlich included the

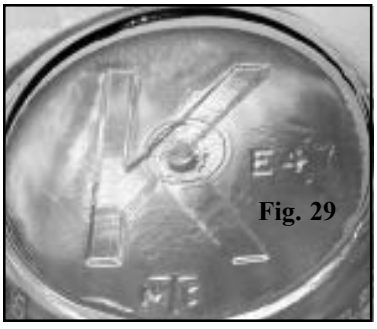


Fig. 29

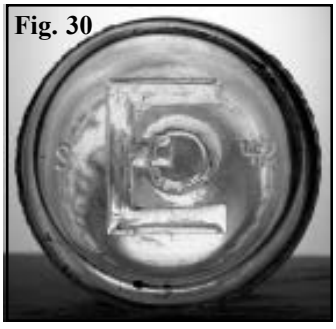


Fig. 30

Table 1 – Thatcher Plant Locations and Dates of Operation

City	State	Dates in Operation	Sources
Kane	PA	1905-1924*	Toulouse (1971:497-498); Ads
Ottawa	IL	1908-1909	Toulouse (1971:498); *National Glass Budget* 1904
Streator	IL	1909-1985**	Toulouse (1971:498); Ads;*Syracuse Herald-Journal* (1985)
Elmira	NY	1912-1985	Toulouse (1971:498) Rawlinson 1969:23; *Milk Dealer* (1916); *Syracuse Herald-Journal* (1985)
Lockport	NY	1920-at least 1944; by 1947	*Wall Street Journal* 1944; Ads
Dunkirk	NY	1920-at least 1936; by 1939	Ads; Moody (1921:615)
Mt. Vernon	OH	1920-1924*	Moody (1921:615; 1924:1010); Ads
Clarksburg	WV	1920-1925	Toulouse (1971:498); Moody (1921:615; 1924:1010); Ads
Cedar Grove	WV	1920-1931	Toulouse (1971:498) Ads; Moody (1921:615; 1924:1010)
Parkersburg	WV	1920-at least 1930; by 1934	Toulouse (1971:498); Ads
Winchester	IN	1922-1923***	Toulouse (1971:498); Ads
Long Island	NY	1933-at least 1941; by 1947	Toulouse (1971:498); Ads; Harvard (2006); Moody; Porter (1935)
Olean	NY	1944-1948 †	*Olean Times-Herald* (1943; 1948); Arrandale (1945); *Bradford Mirror* (1951)
Lawrenceburg	IN	1951-1985	*Glass Industry* 1951; *Syracuse Herald-Journal* (1985)
Jeannette	PA	1951-1961 ††	Harvard (2006); Moody; Whittten 2006
Saugus	CA	1955-1985 †††	*Los Angeles Times* (1955); *Syracuse Herald-Journal* (1985)
Tampa	FL	by 1960-1985	Abele 1960; *Syracuse Herald-Journal* (1985)
Toledo	OH	by 1965-at least 1971	Moody
Wharton	NJ	1966-1985	Kelly and Kelly (2004); *Syracuse Herald-Journal* (1985)

***** Although Toulouse stated that these plants closed in 1925, they were no longer listed in a December 1924 ad (*Glass Container* 4(2):1924:55). The Kane plant was built late in 1904, but production on the new Owens machines took a long while to perfect. As late as March, 1905, no Owens machines were in production outside of the Owens demonstration plant at Toledo ("The Owens Bottle Machine." *National Glass Budget* 20[45]:11. 1905). Therefore the earliest possible year for production at Kane is 1905.

******Rawlinson (1969:23), however, placed the installation in 1907 with a second furnace added in 1908. We have found no confirmation for this.

******* The Winchester first appeared in Thatcher ads in May 1922 but was dropped in September 1923.

† Thatcher controlled the Olean stock by 1935, but the company retained its own identity until January 1, 1944.

†† The Jeanette plant was purchased in 1951 but was first listed in Thatcher ads in 1954.

††† Ads list the Saugus as early as 1954, but it was not completed and in operation until late 1955 (*Los Angeles Times* 1955).

"K" from Kane, Pennsylvania. Marks we have observed fit into the following ranges based on accompanying date codes:

D – 1924-1930
E – 1926-1960
L – 1925-1937
S – 1924-1963

The "S" mark also appeared in association with one TMC basemark and a "24" date code as well as on a bottle embossed T.MFG.CO. (arch) / S / PAT. SEPT. 17TH 1889 (inverted arch) and another that is identical except that it has the T M'F'G CO mark. We have only found the other "D" and "L" factory codes in association with the MTC mark. Both the "S" and "E" codes continued in existence long enough to be associated with the final mark in the inverted triangle shape.

Our sample for non-milk bottles is very small, but we have recorded "O" codes on beer (1953) and food (undated) bottles; "S" with a 1945 date code on a Pepsi-Cola bottle; and "L" (1974) on a liquor bottle. The "O" with a "53" date code is too late for the Olean, New York, plant and too early for the one in Toledo, Ohio. Since only five plants were in operation at the time, and four of those used identified letters (e.g., S for Streator), on the plant at Jeanette, Pennsylvania, remains. If the "O" is, indeed, a plant code, the reasons for the choice are a mystery.

The "S" almost certainly indicates the plant at Streator. The "L" is too late for Lockport and probably indicates the Lawrenceburg factory. A mystery code, however is "N 42" on a milk bottle base, unless it signifies the Long Island, New York, plant. A final letter is a "C" mark that was used in conjunction with date codes from at least 1958 to at least 1962. This could indicate the factory at Saugus, California.

By comparing the ranges for date codes in conjunction with factory codes, it is clear that all fall within the known dates of operation for the main Thatcher plants. Using this as a test, it is almost certain that the "D," "E," "L," and "S" codes represent Thatcher factories, and it appears that the system was continued until at least 1965. By that time, glass milk bottles were rapidly being replaced by waxed paper and plastic, and Thatcher had completed the shift to a dependence on a more diversified container line.

Discussion and Conclusions

Thatcher manufacturer's marks, in general, correspond nicely with Thatcher history and technology. The earlier marks on mouth-blown bottles for example, all pre-date the adoption of the Owens Automatic Bottle Machine and the building of the Kane factory in 1905. The date codes beginning in late 1909 also fit in well with the adoption of the Massachusetts seal at that time. The last date code found on any Owens-machine-made Thatcher bottle was 1926 – almost certainly the end of the phasing out of the Owens machines.

The use of the TMC mark, beginning in 1920 on bottles made with press-and-blow machines, also matches history, as Thatcher acquired the various companies that had formerly used the Hartford-Fairmont machines and began the process of switching to those more versitile machines in Thatcher factories at that time. During the 1920s, Thatcher bottles with Owens scars become increasingly less common until the last one we can trace was made in 1926.

Thatcher was one of the major players in milk bottle production throughout the 20th century, so pinpointing information on its marks and codes is becoming increasingly important. Although the earliest marks from the company are difficult to date closely, Thatcher was one of the early users of date codes, beginning by at least 1909, possibly as early as 1907. This allows virtual pinpoint dating for the manufacture of most Thatcher bottles. In many cases, plant codes also allow the identification of the factory of manufacture, as well.

Future research should address when Thatcher stopped using the 1889 patent date on its bottles. We suspect that may have been concurrent with the adoption of the Owens machines. Research on date and factory codes of more recent bottles (late 1940s on) also needs to be conducted on a larger sample.

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Footnotes:

[1] This was a type of food coloring. At the time (and possibly even today), people judged the quality of butter by its color. A deeper yellow color was perceived as being of higher quality. Thus, Thatcher's Orange Butter Color was used to deepen the hue by many creameries.

[2] Gallagher (1969:50) stated that the earliest milk bottle was made in 1865 but failed to provide details. Gallagher & Munsey (1969:332) claimed the earliest patent for a milk bottle was in 1878. Tutton (1994:2) noted that the first patent for a milk bottle was issued January 5, 1875 (#158,406) and provided the patent office illustration.

[3] Note that ice boxes were also called refrigerators–mechanical refrigerators did not yet exist in homes.

[4] This is problematic. Although Thatcher's 1919 letter implies that this all happened in 1884, that can't be correct. His first patent for a "bottle" was the 1886 Thatcher/Barnhart patent, which was really for a bail-fastened glass closure. It may be that in the meantime he used a bail-fastened metal cap. In any case, he must have taken the wooden mold to Whitall Tatum long before he sent the application to the patent office at the end of 1885.

[5] The identification of the patent with Barnhart was first published in the secondary literature by Tutton (1994:13-14).

[6] Gallagher and Munsey (1969:333) placed the sale of the corporation in 1898. J. A. Arrondale (a longtime Thatcher employee) reported that in 1898 Dr. Thatcher met Baldwin, who "became … interested in Thatcher's work on sanitation in connection with the sale and distribution of milk," but he does not say that Baldwin invested immediately in the corporation (Rawlinson 1970:22). *Glass Container* (1927:7) and Giarde (1980:114) set the Baldwin takeover date at 1900.

[7] This was the Travis Glass Co. It seems likely that it was the early Thatcher experience that soured Travis on machine production.

[8] We have found no evidence of any kind to support Thatcher's manufacture of fruit jars. All Owens machine references we have seen only mention an Owens license for milk bottles and we have found no evidence that the Thatcher Mfg. Co. made any containers by hand or used any other form of machine prior to the 1920 acquisition of the other milk bottle manufacturing companies.

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