The Hemingray Glass Firms

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The Hemingray firms may be divided into several periods, based on changes in the company name or location – moving from Cincinnati, Ohio, to Covington, Kentucky, and finally to Muncie, Indiana. Beginning with Gray & Hemingray in 1848, the names changed to reflect the involvement of various brothers from both families. In 1870, however, the firm incorporated as the Hemingray Glass Co. and retained that name for the rest of its tenure, selling to the Owens-Illinois Glass Co. in 1933.

From the beginning, Hemingray made a large variety of products, and the firm was especially known for its massive insulator production. Although less recognized for its bottle and jar manufacture, the plants nonetheless made large numbers of both items – bottles during two periods (1870s-ca. 1910 and 1924-ca. 1935) and jars from the 1860s to ca. 1910. The various companies used a variety of marks and jar styles that now aid in the dating and identification of the products. Note: Because many of the logos in this section were used by more than one firm or location, we have placed all of them at the end of the history section.

Histories

The ancestral firms that became the Hemingray Glass Co. had many names, and the companies made glass at three locations.

Gray & Hemingray, Cincinnati, Ohio (1848-1852)[1]

Ralph Gray and Robert Hemingray signed a five-year lease on April 1, 1848, for the property at Cincinnati, Ohio, that would become Gray & Hemingray. Located on Hammond St.,

[1] For numerous anecdotes about the various Hemingray interests between 1848 and the 20th century, as well as ads, see McDougald and McDougald (1990:64-83). Their discussion is mainly centered around the company's insulator production.

between Third and Fourth Streets, the plant was completed sometime during 1848, producing flint glass (Hyve 1998:5; Knittle 1927:380; McDougald & McDougald 1990:65; McKearin & McKearin 1941:606; Roller 1996; Stahr 2016; Toulouse 1971:224; Whitten 2016; Woodward 1988:13).

According to Knittle (1927:380), the plant made "a little bit of everything" including: "milk-pans, pitchers, decanters, other tableware, tumblers, lamp glasses, atmospheric fruit-jars, apothecary shop furniture, chemical apparatus, telegraph glasses, lightning rod insulators, perfumes, pickling bottles, bottles, lantern glasses for railroads, lantern glasses for steamboats." Knittle placed the move to Covington "three years later" or 1851.[2]

Gray & Hemingray, Covington, Kentucky (1852-1857)

Knittle (1927:380) stated, "Three years later [i.e., after the plant was built in 1848] the house moved across the river to Covington, Kentucky." This was taken by McKearin & McKearin (1941:606) and Toulouse (1971:224) to mean 1851. Van Rensselaer (1969:228) also used the 1851 date. However, on October 19, 1851, Gray & Hemingray purchased the first of several lots that would provide the space for their Covington, Kentucky, factory although a deed conveyed the main property to Ralph Gray and Robert Hemingray on August 20, 1852. (McDougald & McDougald 1990:67; Roller 1997). This makes it extremely unlikely that the plant would have been constructed within 1851. Thus, 1852 is a much more likely date for the erection of the plant and the beginning of production as confirmed by Stahr (2016) and Whitten (2016). The showroom, however, remained in Cincinnati until 1881. The plant was at Second and Madison Streets. The firm reorganized as Hemingray & Bros. in 1857.

Gray, Hemingray & Bros., Covington, Kentucky (1857-1861)

In 1857, Anthony Gray and Samuel Hemingray joined the company, and the name was changed to Gray, Hemingray & Bros. By this time, the plant made both flint and green (aqua)

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[2] Roller (1996) listed an ad from July 8, 1855, that still showed the factory at the Hammond St. address; however, this probably reflects an advertising range rather than the factory remaining open that late. For example, Hemingray may have placed an ad for six months, so it would have continued even after the move. This was fairly common.

glass. Another change came in 1861 (Hyve 1998:6; McDougald & McDougald 1990:67; Roller 1997; Stahr 2016; Whitten 2016; Woodward 1988:13).

Gray, Hemingray & Bro., Covington, Kentucky (1861-1863)

Anthony Gray withdrew from the business in 1861, creating a slight name change to Gray, Hemingray & Bro. Soon after Ralph Gray died in 1863, the name changed again (McDougald & McDougald 1990:65; Stahr 2016; Toulouse 1971:225; Woodward 1888:13).[3]

Hemingray Bros. & Co., Covington, Kentucky (1864-1867)

After Gray died in 1964, the firm became Hemingray Brothers & Co. Although sources disagree, the firm became R. Hemingray & Co. ca. 1867[4] (Hyve 1998:5-6; McDougald & McDougald 1990:65; Stahr 2016; Toulouse 1971:225; Whitten 2016; Woodward 1988:13). Roller (1997) still showed Hemingray, Bros. & Co. listed in directories until 1867.

R. Hemingray & Co., Covington, Kentucky (1868-1869)

R. Hemingray & Co. only lasted for a short period of time – ca. 1867-1869. But change came again in 1870.

Hemingray Glass Co., Covington, Kentucky (1870-1890)

The Hemingray Glass Co. incorporated on March 21, 1870, with a capital of $250,000.[5] The board consisted of Robert Hemingray, Ralph Gray Hemingray, Richard Evans, Edward W.

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[3] Hyve (1998:6) and Stahr (2016) noted that Ralph Gray died in 1863, and "shortly afterward Robert and Samuel Hemingray changed the name to 'Hemingray Bros. & Co.'" Whitten (2016) also placed the change at 1863.

[4] Hyve (1998:6) placed the name change at 1866; the McDougalds (1990:65) noted it a year later (1867); but Woodward (1988:13) had it at 1868. Most online sources use 1868

[5] Toulouse (1971:246) placed the beginning of the Hemingray Glass Co. at 1882, way out of line with any of the other sources.

Evans, Amos C. Shinkle, and James Foley. The plant had only a single furnace in 1886 (Hyve 1998:6; McDougald & McDougald 1990:65, 69; Roller 1997; Stahr 2016; Toulouse 1971:246; Whitten 2016; Woodward 1988:13). The company maintained a branch office (not a factory) in St. Louis from ca. 1873 to ca. 1878. The plant was actively making bottles and a large variety of glass (including tableware, jars, novelties, and insulators) during this period (Hyve 1998:107).

The *Covington Daily Commonwealth* for February 1, 1881, announced that Hemingray had completed a new building on Second St., although they did not mention its purpose. A March 21, 1885, letterhead noted that R. (Robert) Hemingray was president, with R.G. (Ralph Gray) Hemingray as vice president and B. Evans (probably Richard Evans) as treasurer. The firm built a new plant at Muncie, Indiana, in 1888, and closed the Covington factory. However, when the Muncie plant burned in 1892, the company revitalized the Covington operation. Even though the firm rebuilt the Muncie factory in 1893, the Covington plant continued to run until at least 1896 (Roller 1997).

The Covington Glass Co. gained control of the factory by June 1898 and incorporated in mid-September with a capital of $20,000. By December, however, the firm was out of business. James M. Rude leased the firm in 1899 but declared bankruptcy the same year. James L. Bond picked up the lease later in 1899, but the plant was listed as "not in operation" in 1900 and was no longer listed after that date (Roller 1997). None of these were known to have used any manufacturer's marks.

Hemingray Glass Co., Muncie, Indiana (1888-1933)

On December 10, 1887, the City of Muncie, Indiana, offered Hemingray a deal too good to refuse. If the company moved to Muncie, the city would provide "free gas, either as a well, or connection with some other well nearby," eight acres of land for the factory, $10,000 in cash, and several other monetary payments as construction progressed (McDougald & McDougald 1990:73). The company moved to the new plant with a single furnace in 1888 (Hyve 1998:6; McDougald & McDougald 1990:65; Roller 1999; Stahr 2016; Toulouse 1971:246; Whitten 2016; Woodward 1988:13).

Even though the new factory was opened in Muncie, the old plant at Covington remained standing – which turned out to be a good decision. On June 20, 1892, *Commoner & Glassworker* reported a fire destroyed everything in the Muncie factory except the batch room and office. The firm reopened the Covington plant until it could rebuild the one at Muncie – reopened by the following year at Macedonia and Eighth Streets. By at least 1896, the plant had two furnaces (Roller 1999).

By 1897, Hemingray had one furnace with 14-17 pots and two continuous tanks. In 1904, the Muncie plant used three continuous tanks with 18 rings along with a single furnace to make "pressed and blown tableware and novelties; insulators." R.G. Hemingray was president of the corporation, with D.C. Hemingray as secretary and treasurer and J.C. Gray as manager (*American Glass Review* 1934:151; *National Glass Budget* 1897:5; Roller 1999).

On March 30, 1905, *Commoner & Glassworker* reported that the Muncie plant had installed two container machines; although the journal did not mention the type, these could only have been semiautomatic. In April, the operation laid off lamp and iron mold shops to make room for more insulator and fruit jar shops (Roller 1983:141; 1999). The plant was no longer listed under bottles from 1907 on, although it still made fruit jars in 1909. By the next Thomas Register in 1912, the jar listing, too, had disappeared (Thomas Publishing Co. 1905:103, 577; 1907:798; 1909:1100).

The company was also unlisted in a 1913 "Glass Bottle and Hollow Ware" enumeration (*Journal of Industrial and Engineering Chemistry* 1913), suggesting that jar production had ceased by then. The plant installed automatic insulator machines in 1919 and an automatic container machine in 1925 – and made "narrow-neck ware, vinegars, and horseradish and beverage containers" by 1926 (Toulouse 1971:247-248).

In 1927, the plant made "glass insulators" at three continuous tanks, although no other products were listed. In 1928, however, the listing changed to "glass insulators and bottles," and that continued until 1933. The 1934 edition noted that Hemingray was now a "unit of Owens-Illinois Glass Co."(*American Glass Review* 1927:95; 1928:73; 1933:66; 1934:94). The timing suggests that Hemingray was another victim of the Great Depression.

It is also possible that the very diversity of the product line contributed to the sale of the firm. Hemingray manufactured tableware, bottles, jars, and insulators, and the creation of each required different skills. This variety suggests the potential for union conflicts, but we have found no suggestion of a union connected with Hemingray.

Table 1 – Hemingray Factory Chronology

Operating Name	Location	Dates
Gray & Hemingray	Cincinnati, Ohio	1848-1851
Gray & Hemingray	Covington, Kentucky	1852-1857
Grey, Hemingray & Bros.	Covington, Kentucky	1857-1861
Grey, Hemingray & Bro.	Covington, Kentucky	1861-1863
Hemingray Bros. & Co.	Covington, Kentucky	1864-1867
R. Hemingray & Co.	Covington, Kentucky	1867-1869
Hemingray Glass Co.	Covington, Kentucky	1870-1890
Hemingray Glass Co.	Muncie, Indiana	1888-1933
Owens-Illinois Glass Co.	Muncie, Indiana	1933-1972

The Owens-Illinois Glass Co. purchased "the entire assets and business of Hemingray Glass Company" in 1933 for 17,827 shares of Owens-Illinois stock and $177,000 in cash (Owens Illinois 1933:10). After Owens-Illinois acquired the firm, the plant was used to make beer bottles for a couple of years – probably until the Hemingray molds wore out (Toulouse 1971:249; Stahr, personal communication 2006). In April 1935, the Muncie factory produced the first Insulux Glass Blocks, "a hollow water-clear pressed glass unit 3 7/8" thick, hermetically sealed at high temperature with a near vacuum center" (Owens-Illinois Glass Co. 1943:47).

In 1937, Owens-Illinois created the Industrial and Structural Products Division with the Muncie factory as the exclusive producer of both insulators and Insulux Glass Blocks (Owens-Illinois 1937:6, 12). Owens-Illinois dropped insulator production in 1967 because sales were poor and closed the factory on July 15, 1972 (McDougald & McDougald 1990:65, 77; Roller 1999; Stahr 2016). See Table 1 for a chronology of the firms.

Containers and Marks

Hyve (1998:107-167) showed various ads from the Hemingray dynasty. The earliest (1849) advertised "every variety of flint glass ware, apothecary's furniture and chemical apparatus made to order at the shortest notice. Also a great variety of perfumer's ware." Ads by 1869 included fruit jars, brandies, hock wines, demijohns, screw cap flasks, tumblers, and a variety of other non-bottle items. Other ads (1873) listed ring jars, specie and squat jars, confectioners' jars, ale, porter, brandy and Schnapps bottles. By 1878, the ads included beer bottles and mineral water bottles. At some point, Hemingray discontinued the production of bottles, although fruit jar manufacture continued until at least 1910, possibly later.

Bob Stahr has collected an incredible volume of information on the Hemingray Glass Co. Among other things, he has collected more than 2180 Newspaper articles and 892 trade journal articles. He is planning a book on the company. Stahr (personal communication) added:

> Hemingray was still producing Globe fruit jars as late as 1907 and a 1903 catalog shows a full line of battery jars. In 1915 one of Hemingray's employees also patented a bottle machine. My estimation is that bottle production ceased around 1910.

A 1927 ad noted

> Three years ago, . . . we resumed production of one of our earlier lines–BOTTLES. Today, at almost any dispensary of beverages, you are possibly served from one of our bottles. Our quality has secured for us the larger customers in the field. Bottles for home use can be secured from our local dealer (Hyve 1998:127).

Our best estimate is that bottle and jar production (excluding perfume bottles) extended from ca. 1869 to ca. 1910, probably ceasing because of the pressure caused by automatic and semiautomatic bottle production by other glass houses. Bottle production resumed in 1924 – with the use of automatic machinery – and continuing until the sale to Owens-Illinois in 1933. It is possible that the firm made very crude wax-sealer fruit jars a few years earlier.

One website noted 58 soda and beer bottles made by Hemingray (Kotlarsky 2016). The soda bottles pictured are of the specialty or proprietary style, generally made between the late 1920s and the early ACL era, late 1930s-early 1940s. The plant also made bottles for White House Vinegar, bleach, and a "kerosene stove jar" as well as numerous fruit jars.

G&H (1848-1857)

Knittle (1927:441) identified "G.&H." as belonging to Gray & Hemingray. Hyve (1998:169) observed, "Of all the bottles and jars that were made at that time (1848-1863), only a few have been seen with a 'G & H' (Gray and Hemingray) marking, only one container with the name spelled out, and a few fruit jar lids that have the name cast in metal." Toulouse (1971:224-225) also discussed the logo and dated it ca. 1848 to 1864. However, he noted that the mark was "found on insulators rather than bottles." Lehner (1978:30) noted the logo on Globe jars, but she was mistaken. We have been unable to locate an example and suspect that this mark does not exist.

GRAY & HEMINGRAY (1848-1857)

Hyve (1998:169) noted that for this company there was "only one container with the name spelled out, and a few fruit jar lids with the name cast in metal." We have not found any examples of these; she may have meant the Gray, Hemingray & Bros. jar discussed below.

GRAY.HEMINGRAY & BR^{OS} (1857-1861)

North American Glass offered a single rectangular jar embossed "GRAY.HEMINGRAY & BR^{OS} / CINCINNATI.OHIO / PATENT / APPLIED.FOR" on one side and "P.SMITH / SOLEAGENT / CINCINNATI / OHIO" on the other (the actual embossing lacked spaces between the words). The jar was blue with a "screen" design of crossed lines on all sides and a raised ring (triangular in cross-section) encircling the center and horizontally on both short sides. One side had an uneven pour spout (Figures 1 & 2).

Figure 1 – Gray, Hemingray & Bros (North American Glass)

We have no idea who P. Smith may have been, and we have been unable to find a patent for

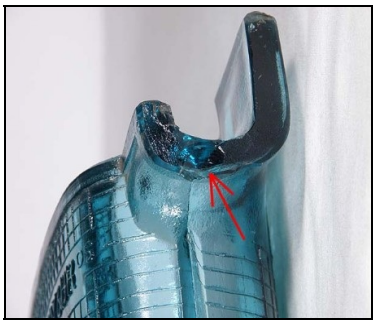


Figure 2 – Pour spout (North American Glass)

this jar – or even its use. – although it may have been for some form of battery acid container. The patent may never have been issued, and this may have been the firm's only marked jar.

H.G.CO. (ca. 1874-1910; 1924-1933 on bottles)


Figure 3 – HGCo insulator (eBay)

This mark was used by Hemingray on the skirts of insulators during the 1870-1932 period (McDougald & McDougald 1990:78; Woodward 1988:14-15). Many of these were also embossed with an "H" on the crown (Figures 3 & 4). Toulouse (1971:246-47) ascribed the H.G.Co. mark to the Hemingray Glass Co. Covington, Kentucky, and claimed a use from 1882 to 1933, although he did not note the type of glass. Lehner (1978:30) agreed that H.G.Co. was used by Hemingray but did not include any date range.

Figure 4 – H on crown (eBay)

Hyve (1998:169) added that "the earliest use of the 'H.G.CO.' mark that can be determined is on the base of beer and soda bottles made sometime in the 1870s," and Von Mechow (2016) also listed 18 bottles with the "H.G.CO." basemark – all on beer bottles. In all photos and drawings we have seen and in our own observation of beer bottle bases, the mark was always embossed horizontally across the center of the base (Figure 5), except on Hutchinson soda bottles, where it was embossed on the heel. The export beer bottle was invented in 1873, the year after Anheuser-Busch introduced the concept of Pasteurization to American brewing. The widespread use of beer bottles dates to this period. It is probable that Hemingray began beer bottle production ca. 1874 or 1875.

Figure 5 – HGCo basemark

The mark is best known on beer bottles (Hyve 1998:178; Stahr 2016), but it was also used on blob-top and Hutchinson soda bottles (Hemingray.net 2007) as well as Mason jars (Creswick 1987:138). Our observation found the mark on an amber export beer bottle with an applied finish. There is no evidence to suggest that the poison bottle with the H.G.Co. mark, produced by Whitall Tatum & Co., was in any way connected with Hemingray. These bottles cobalt blue, screen-patterned bottle are very common. They were produced by Whitall Tatum & Co. (see the Whitall Tatum section for more information).

HGCo monograms (ca. 1870s-1880s)

Hemingray made a style of Mason jar embossed with an HGCo monogram (Kotlarsky 2016). Roller (1983:228; 2011:365) explained that the HGCo monogram was found on jars embossed "MASON'S / PATENT / NOV 30TH 1858" (Figures 6 & 7). The jar was made by Hemingray ca. 1870s. Creswick (1987:129, 135) illustrated the same jar and dated it "circa 1870 or later" but added a second variation in the monogram, also apparently used by

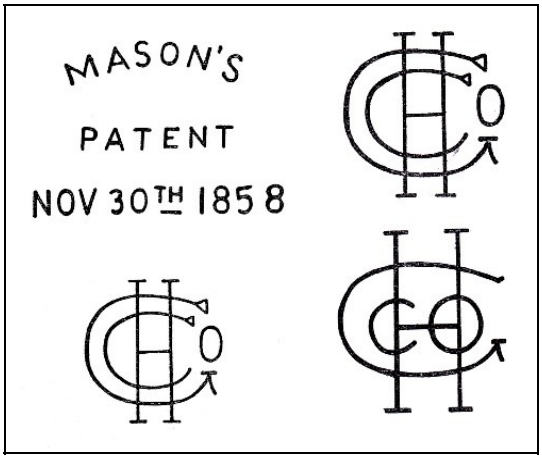


Figure 6 – HGCo monograms (Roller 1983:228)

Hemingray (Figure 8). Hemingray.net (Kotlarsky 2016) also showed a product jar with metal lid embossed with an HGCo monogram (Figure 9). According to McCann (2016:253), black variations of the Mason jar – with or without the monogram – are worth more than $10,000 each. He added that one monogrammed variation had "NOV. 30TH 1858" embossed on one line. Unfortunately, he did not note which monogram. Most (possibly all) of these jars were also embossed on their bases with a large number (Figure 10).

Figure 7 – HGCo monogram (eBay)

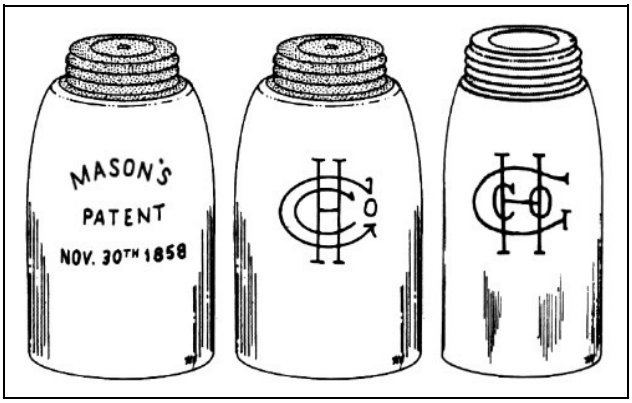


Figure 8 – HGCo monograms (Creswick 1987:129, 135)


Figure 9 – Monogram on jar lid (Kotarsky 2016)

HEMINGRAY (1924-1933 on bottles)

According to Toulouse (1971:246), the company used the full word "HEMINGRAY" from 1870. The mark was common on insulators during the 1870-1932 period (McDougald & McDougald 1990:78; Woodward 1988:14-15). Hyve (1998:169-171), however, stated that "insulators made after 1900 were marked 'HEMINGRAY'" – the trademark registered on March 29, 1910 (Figure 11). As the use of the name on bottles is less conflicted, we will let the insulator folks untangle this one.

Figure 10 – Base number (eBay)

Figure 11 – Hemingray insulator (eBay)

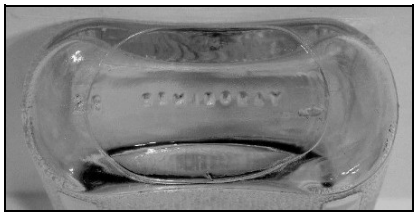


Figure 12 – Refrigerator base (eBay)

The main type of bottle to wear the "HEMINGRAY" name was the refrigerator or water bottle – used to keep water cold in refrigerators. Most of these had "WATER" embossed on the front along with an elaborate design (Figures 12 & 13). An especially pretty example was embossed with a design of a wishing well (Figure 14). Ernest E. Bilby designed this jar and applied for a patent on February 19, 1931. He received Design Patent No. 86,659 on April 5, 1932 (Figure 15). Similar bottles remained popular until at least the 1940s, when one of the authors grew up with an example in his parents' refrigerator. These bottles were almost certainly made during the second bottle period, 1924-1933. We have not seen the name embossed on other bottles.


Figure 13 – Refrigerator bottle (eBay)

Figure 14 – Wishing well (eBay)

H-30 or other numbers (ca. 1924-ca. 1935)

Whitten (2016) cited Stahr that the "H" mark with numbers was embossed on bottle bases by Hemingray from ca. 1924 to ca. 1935. Bob Stahr (personal communication, 2006) added that "the H-30 style numbers appear primarily on sodas but there are some beers that have H 28 type numbers without the dash. These bottles will be ice blue or 7-up green." Beer bottles

were frequently embossed H101 or H103. The number for refrigerator water bottles was H510. It is almost certain that these were catalog or model numbers.

The game, of course, is larger than we think. Heinz, Hemingray, and possibly other glass houses used marks in the "H-*xx*" or "H *xx*" formats. Other glass houses also used "H" basemarks with numbers. See sections on Hamilton, Hart, Hazel-Atlas, Heinz, Holt, and Other H for more on the widespread use of "H" logos. There is no reason to believe that Hemingray used the "H" logo without a corresponding model number, and we only know of the use of the mark by Hemingray on beer, soda, and refrigerator bottles.

Figure 15 – Bilby 1932 patent

H in a circle (ca. 1924-ca. 1935)

According to Whitten (2016), this mark was used by the Hemingray Glass Co. from.1924 to 1935. Stahr (personal communication) added that "H in a square and H in a circle appear on beers only." We have yet to find an example of the circular logo.

H in a square (ca. 1924-ca. 1935)


Figure 16 – Box-H logo (eBay)

Whitten (2016) noted that the Box-H mark was used by the Hemingray Glass Company, Muncie, Indiana from ca.1924 to 1935 (Figures 16 & 17). Stahr (personal communication) stated that during the second round as a bottle producer Hemingray made "sodas, beers, vinegar jugs, refrigerator bottles, gins, wines, etc.," although the H in a square mark only appeared on beer bottles. He added:


Figure 17 – Box-H bottle (eBay)

Numerous shards of these H in a square bottles were excavated at the Muncie factory of Hemingray. A lone insulator with the H in a square logo exists and is a known Hemingray product. Some water bottles marked HEMINGRAY also have a style number such as H510 on the heel. A few beer bottles have turned up with H101 and H103 numbers on the heel in addition to the H in a square.

When asked about the end date for the marks, Stahr (personal communication) replied:

> Although Hemingray was purchased in 1933, there are many of the bottles that were produced at the plant through 1935 in Hemingray molds. Ice blue colored glass was dropped in the 1935/1936 time frame because glass block production necessitated clear glass. The amber beers and amber water bottles for instance are all from 1935 and have the Owens-Illinois logo added to the Hemingray mold as well. . . . Bottles were produced a number of other times since 1935, but those would have exclusive Owens-Illinois logos with the plant code of 26 or 86 for Muncie.

Figure 18 shows a base with both the Box-H and Owens-Illinois logo. The date code on the base is "3" – indicating that the plant made the bottle in 1933. This was obviously a Hemingray mold with the Owens-Illinois logo and codes added.

Figure 18 – Box-H + OI (eBay)

Fruit Jars

Hemingray made a variety of jars, although only two were named: Globe and Royal (other than a patentee name or patent dates). Collectors have identified several other jars as produced by Hemingray based on patent numbers, color or base numbers. The Hemingray website (Kotlarsky 2016) illustrated three blackglass jars,[6] one embossed with a Hemingray monogram, one Mason jar, and one grooved-ring wax sealer, although a few Royal jars were

[6] These are actually very dark green or amber in color, although occasional sources state that they could also be very dark amethyst or purple. They are often so dark that only a thin sliver of glass will reveal the actual color.

also produced in black. In addition, Kotlasky showed jars in a color he called "Covington Blue" – presumably a glass color specific to the Covington plant. Beyond that, collectors had ascribed a specific style of number to the firm (see below) On July 17, 1869, the *Covington Journal* reported that R. Hemingray & Co. produced "10.000 fruit jars per day" (McDougald & McDougald 1990:67).

GLOBE (1886-ca. 1910)

Hemingray made numerous fruit jars in various sizes and colors with GLOBE embossed on the body (Figure 19). The name GLOBE was also embossed on tobacco jars made by Hemingray (Kotlarsky 2016). The company registered the "GLOBE" trade mark on February 3, 1903, claiming first use in 1886 (Creswick 1987:72; Peterson 1968:41; Roller 1983:140). An April 21, 1887, Hemingray ad recommended the Globe Fruit Jar to housewives, and a Hemingray letterhead from October 7, 1896, illustrated a figure of the Globe jar (Roller 1997).

Figure 19 – Globe jars (North American Glass)


Figure 20 – Globe lids (North American Glass)

Toulouse (1969:135) illustrated a jar embossed "GLOBE" on the side. He described the closure as a "glass lid, held by hemispherical cam moving in a socket, held by bail" (Figure 20). He noted that the lid was embossed "PAT MAY 25 1880" – a misreading (or typographical error) of the 1886 patent date. He dated the jar as being used in 1880 (based on the faulty reading of the date) but did not know the maker. Roller (1983:140-141) also listed the Globe jars and noted that the May 25, 1886, patent for them was issued to Robert Hemingray (see patent section below). The jars, however, had been made prior to the receipt of the patent; some were embossed "PAT.

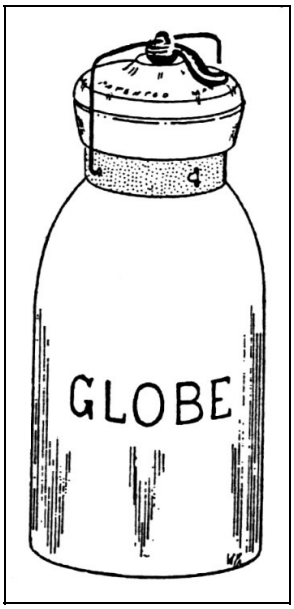


Figure 21 – Globe jar (Creswick 1987:72)

APPLD. FOR" on the base. Hemingray had installed machines for making jars by 1905 and made Globe jars by both hand and machine methods. Roller noted that machine-made jars were "much scarcer" than those made by hand, a likely indication that production of the Globe ceased fairly soon after the inception of machine production.

Figure 22 – Base number (North American Glass)

Creswick (1987:72) illustrated the Globe jar but did not include dates (Figure 21). However, she noted that the Hemingray Glass Co. of Covington, Kentucky, received Trademark No. 39,727 for "GLOBE" on February 3, 1903, claiming a first use in February 1886. She added that the lid was embossed either "PATENTED MAY 25 1886" or "PATENTED MAY 25TH 1886" (see Figure 20). According to Roller (2011:216), all of these jars had a large number embossed on their bases (Figure 22). In opposition to Creswick, the editors noted the lids as either "PAT. APPLD. FOR" or "PATENTED MAY 25 1886" – but we have not found an example of the Pat Appld For variation. They dated the jars ca. 1886-1900s. A trade note reported that the Muncie plant made amber Globe jars in 1899. An interesting variation was apparently a very small salesman's sample jar (Figure 23).

Figure 23 – Salesman's sample (North American Glass)

McCann (2016:190) illustrated some of the jars. The regular-mouth variation had a rounded shoulder, but the wide-mouth model had straight sides. He also noted a brown stoneware version of the jar that was "usually found in the Midwest and Canada."

Globe jars were undoubtedly made from 1886 to the end of jar production ca. 1910. The presence of the 1903 trademark and machine-made jars both indicate a post-1903 production. All of the jars were made by the Hemingray Glass Co., although some of the earlier ones were certainly manufactured at the Covington factory.

ROYAL (ca. 1870-ca. 1877)

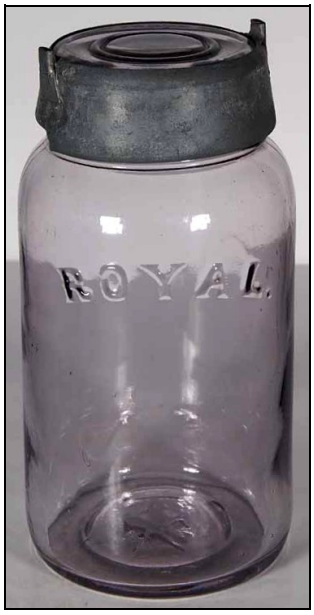


Figure 24 – Royal jar (North American Glass)


Figure 25 – Royal closure (North American Glass)

Hemingray made some fruit jars embossed ROYAL on the front body (Kotlarsky 2016). Toulouse (1969:264-266) listed six Royal jars, most of which were made for A.G. Smalley, and one made by Consumers Glass Co., Toronto, Canada. One, however, was hand made in amber and cobalt blue colors embossed "ROYAL" on the side and "PAT FEB 27, 1877" on the lid (Figures 24 & 25). He did not know the maker. He also included a jar marked "ROYAL OF 1876," also noted as "maker unknown" (Figure 26).

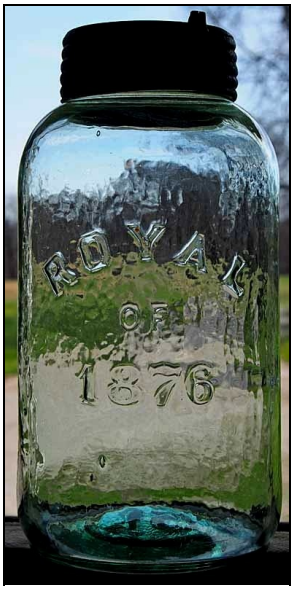


Figure 26 – Royal of 1876 (North American Glass)

Roller (1983:309-310) listed three variations of the Royal (not including the Smalley Royals). One was only marked "ROYAL"; another also had "PAT FEB 27 1877" on the base; and the final one was "ROYAL OF 1876." All used a unique lid with a glass top held in place by a screw-thread band. The band was somewhat unique with two "ears" or lugs sticking up to take a wrench. By at least June 15, 1876, an ad for Hemingray included "'Royal' Improved Screw-Top Porcelain-Lined Self-sealing Fruit Jars" (Roller 1996).

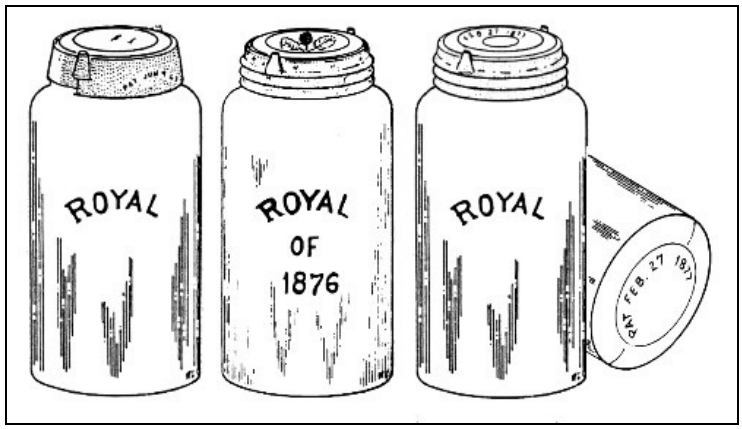


Figure 27 – Royal jars (Creswick 1987:185-186)

Creswick (1987:185-186) illustrated all three variations and noted that one marked only "ROYAL" had PAT JUNE 9 63" stamped into the metal band (Figures 27 & 28). Accordingly, she dated that variation ca. 1863. She added that the lids could have either a "berries and leaf decoration" or be embossed "PAT'D FEB 27 1877."

Figure 28 – Patent stamp (North American Glass)

Roller (2011:452-453) dated and discussed each of the three variations separately.

ROYAL

This jar was only embossed "ROYAL" on the side with nothing on the base. The lid was unembossed with "PAT JUNE 9 63" stamped into the side of the band – made ca. 1870s.

ROYAL – PAT FEB 27-1877 on base

This jar was embossed "ROYAL" on the side and "PAT FEB 27-1877" on the base. The closure was the same as for the Royal jar described above. The editors noted that Adam Dickey patented the jar (see patent section below); the jar was made of blackglass to protect the natural color of the fruit inside. Although most lids were unembossed (Figure 29), some black lids had a leaves and raspberry design. He dated these jars ca. late 1870s.


Figure 29 – Blackglass lid (North American Glass)

ROYAL / OF / 1876

This jar was embossed "ROYAL / OF / 1876" on the side and was made ca. 1876. The lid had the leaves and berry design embossed on the inside (Figure 30). The editors noted that there has been some speculation that the jars were made in honor of the centennial of the founding of the country. An 1876 Hemingray ad noted "'Royal' Improved Screw-Top Porcelain-

Lined Self-Sealing Fruit Jars" – even though none of the lids or jars found were made of "porcelain" (opal or milk glass).

McCann (2016:297-298) listed the Royal and Royal of 1876 as available except for blackglass jars. Those appear to be extremely rare in all three variants. He noted that only one Royal of 1876 jar is known in black and that it was probably made prior to Dickey's February 27, 1877, patent that called for blackglass.

Figure 30 – Leaf and berry lid (North American Glass)

Table 2 – Probable Chronology of Jars Made to the Gray & Hemingray 1863 Patent

Distinguishing Feature	Embossing	Closure	Dates
Narrow mouth (2¼")	None	All metal cap	1863-?
Ribbed jar (2¼")	None	All metal cap	1863-?
Wider mouth (2-5/8")	None	Metal cap w/ glass insert	?-ca. 1870
Constricted mouth	ROYAL	Glass insert & metal band	ca. 1870-1875*
Constricted mouth	ROYAL OF 1876	Glass insert & metal band	1875-1876
Constricted mouth	ROYAL (PAT FEB 27-1877 on base)	Glass insert & metal band	1877

* Production of these may have continued to 1877 or later.

Roller was likely correct about the 1870s dates for these jars. The one embossed with the 1876 date was very likely made in commemoration of the Declaration of Independence 1776 centennial – and it was probably only made during that year, possibly into 1877. The pressing question is whether the other jars were made prior to the 1876 jar or afterward. The blackglass jar with the 1877 patent date was certainly not produced prior to 1877 but it is likely that the other variation preceded both of those. Our reason for this statement is the lack of ghosting on Royal jars. If the Royal of 1876 molds were used for later jars, the "of 1876" would be ghosted. It is therefore more likely that the Royal jars were used to make both other variations with the retooling of "of 1876" on one variation and the 1877 patent date on the base of the other. We

have selected ca. 1870 as the initial date for product based on the presence of similar jars without the "Royal" embossing. Table 2 provides a probable chronology for jars – both Royal and "Cincinnati" (see below) – made to the 1863 patent.

Figure 31 – 1863 jar (North American Glass)

"Cincinnati" Jars (ca. 1862-ca. 1870)

Figure 32 – 1863 lid (North American Glass)

Roller (1983:278) discussed a jar with a tinned iron cap that was embossed "PATENT JUNE 9 1883" around "CIN. O" on the top (Figures 31 & 32). These were essentially the same as the Royal jars described above but were made earlier. The jars, themselves were unembossed, but the caps had several variations (see below). Roller noted that

> these so-called "Cincinnati" jars are found in several styles with two sizes of mouths. The older and more common jars have a narrower mouth (2¼"), while the less commonly found later jars have a wider mouth (2-5/8"), and use a glass lid between the jar lip and the cap bottom to help prevent a metallic taste in the jar contents. The 'Cincinnati' were probably replaced in the Hemingray line by the Royal jars.

Variations included a tall, narrow 15-paneled jar (called "melon ribbed" by Kotarsky 2016) and a wide-mouth style (Figure 33). He included a drawing of a deep lid (Figure 34 – also see Table 3). At least one jar was made in a three piece mold (dip mold with two shoulder pieces) – as shown in a North American Glass photo.

The Roller editors (2011:411) included five variations that noted differences in the wrench lugs, variations in embossing, and depth of the cap (shallow and deep). See Table 3. Like one of the jars mentioned above, McCann (2016:276) noted that some of these being sold with a reproduction cap (Figure 35).

Table 3 – Lids Made to the June 9, 1863, Patent (after Roller 2011:411)

Depth	Dia	Embossing	Lugs	Dates
Shallow	2¼"	PATENT.APPLIED.FOR. around CIN. O	iron rods, soldered to cap	1932-63
Shallow	2¼"	GRAY HEMINGRAY & BROS CINCINNATI OHIO	cast-alloy, molded on cap	1863-64
Shallow	2¼"	None	iron rods, soldered to cap	1864-68
Shallow	2¼"	PATENT JUNE 9 1863 CIN. O	rolled up tinned-iron, soldered to cap	1864-68
Deep	2-5/8"	PATENT JUNE 9 1863 CIN. O	rolled up tinned-iron, soldered to cap	1868-70

Figure 33 – Melon ribbed jar (Kotlarsky 2016)

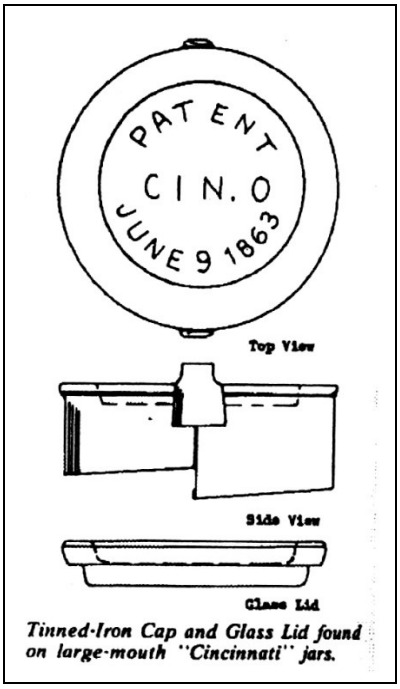


Figure 34 – Deep lid (Roller 1983:279; 2011:412)

Figure 35 – Repro cap (North American Glass)

WEBSTER'S PATENT (1964-mid-1870s)

Figure 36 – Webster's jar (North American Glass)

Figure 37 – Webster's lid (North American Glass)

Roller (1983:377) noted two variations of this jar. One was only embossed "WEBSTER'S / PATENT FEB. 16 1864" – and this one had a flat ledge on the finish. The other included the 1864 patent number and had a grooved finish (Figures 36 & 37). Creswick (1987:216-217) illustrated six glass variations of the container and one made of tin (Figure 38). One variation had rounded shoulders and was embossed "WEBSTER'S," while three had straight sides. One of these had "WEBSTER.S," while another had a space between the "R" and "S." The third had "WEBSTER'S" on the front as well as the 1860 patent on the reverse. The tin can was unmarked but used the Webster finish. Her final example was embossed "PATENTED WEBSTERS / SEPT 18 1860 / FEB 16 1864" – all ghosted. The jar had a sloped shoulder. She attributed all variations to Gray, Hemingray & Bros. and Hemingray Bros. & Co.

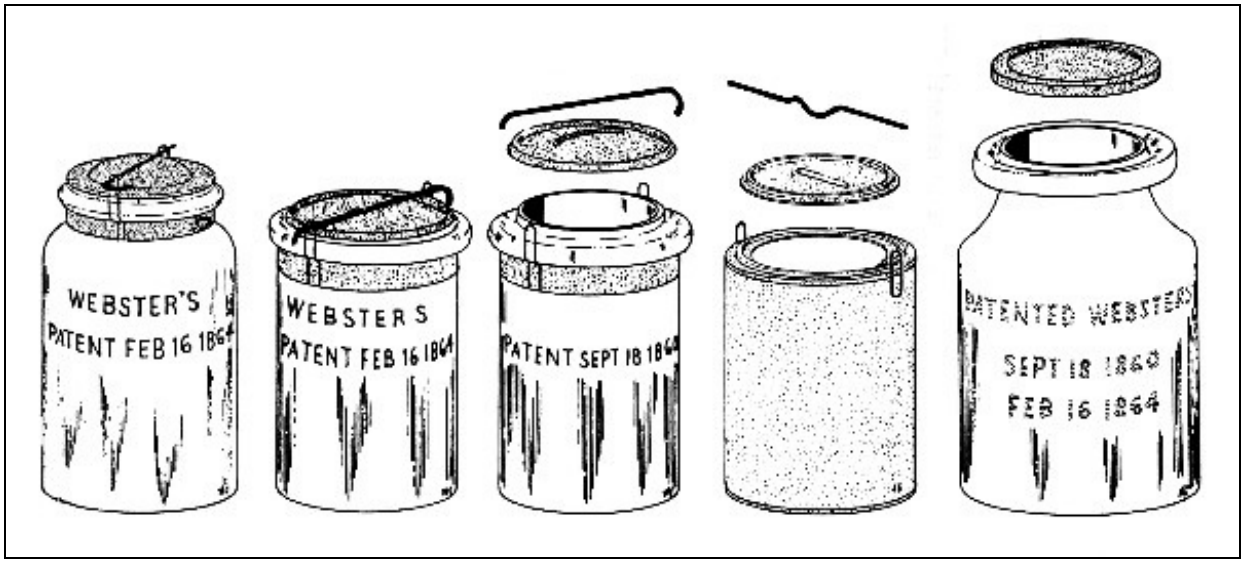


Figure 38 – Webster's variations (Creswick 1987:216-217)

A Hemingray 1876 ad (Roller 2011:453) offered "Wire-Top Fruit Jars for Wax" – likely a description of the Webster jars. Roller (2011:545) divided the jars according to the finish – flat or grooved. The editors noted the maker of the flat-finished jars as unknown and were cautious about the grooved-ring variation, stating that it was "probably made circa 1860s by Hemingray Brother & Company." Both types of jars appear to be quite rare. McCann (2016:336) suggested a $5,000+ price tag for one with the flat rim and an original lid and noted that both are "unavailable." Use of these jars almost certainly began in 1864 and may have lasted until the 1876 ad – although probably not much beyond that year.

Grooved-Ring Wax Sealers (1860-1880s)

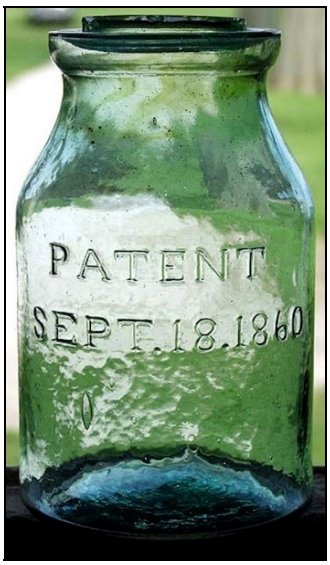


Figure 39 – Wax Sealers (Lindsey)

When Robert Hemingray received a patent for his mold to make grooved-ring wax-sealer fruit jars on September 18, 1860 (or possibly before), Gray, Hemingray & Bros. used the new technique to make jars embossed with the patent date (Figure 39). Lindsey (2016) provided a good synopsis of the mold, technique, bottles, and patent. Kotlarsky (2016) illustrated two wax sealers made by the same technique – but without the patent embossing. One of these was in Covington Blue, the other in blackglass with a large "3" basemark. North American Glass included a photo (Figure 40). These almost certainly indicated that such jars were made prior to the patent or after it expired – or both. Note in Figure 41 the side seams extending into the finish.


Figure 40 – Wax sealer (North American Glass)


Figure 41 – Side seams (North American Glass)

Creswick (1987:169) illustrated two variations of wax sealers embossed "PATENT / SEPT. 18. 1860" on the side (Figure 42). The only difference was a rounded shoulder in one

variation and a steeper one in the other with a longer neck. There were also similar jars without the embossed patent date.

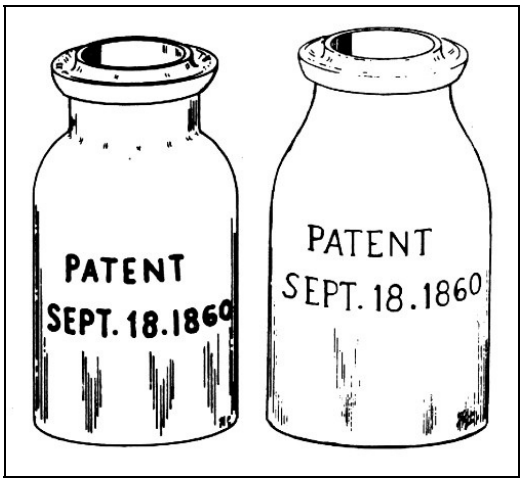


Figure 42 – Wax sealers (Creswick 1987:169)

Kotlarsky (2016) also illustrated five "push down wax sealers" – jars that were made by a very early technique where the glass blower pushed down with the blowpipe to create the groove. These jars were very crude and were sealed with glass caps pressed into the wax in the grooves (Figure 43). At least one was made in Covington Blue – possibly the reason Kotlarsky suggested that they were made by Hemingray. They would probably have been made during the late 1850s to mid-1860s by Grey & Hemingray, Grey, Hemingray & Bros., and/or Grey, Hemingray & Bro.


Figure 43 – Early wax sealers (Kotlarsky 2016)

Mason Jars (mid-1870s-1880s)

Hemingray made Mason jars, probably during the mid-1870s-1880s. The jars were embossed "MASON'S / PATENT / NOV 30TH / 1858" (one with "MASONS"). The examples from Kotlarsky (2016) and North American Glass mostly showed the jars made of blackglass, although North American Glass also identified a blue Mason jar as being made by the firm – almost certainly based on the large-numeral basemark (Figures 44 & 45). Note in Figure 45 that the "7" is reversed.


Figure 44 – Mason bases (North American Glass)

Numbers

Many of the Hemingray jars had large embossed numbers on their bases (see Figures 10, 23, & 44). The numbers ran as high as 80 on a Globe jar. These were almost certainly mold numbers, a form of quality control to establish which mold was making faulty jars. These were embossed on many (possibly most) jars made by any of the Hemingray plants of firm names. We have observed these in North American Glass or Himingray.net photos on Globe, Mason Patent, wax sealer, and Royal jars. The numbers appear to have been used during most of the period when Hemingray produced fruit jars.

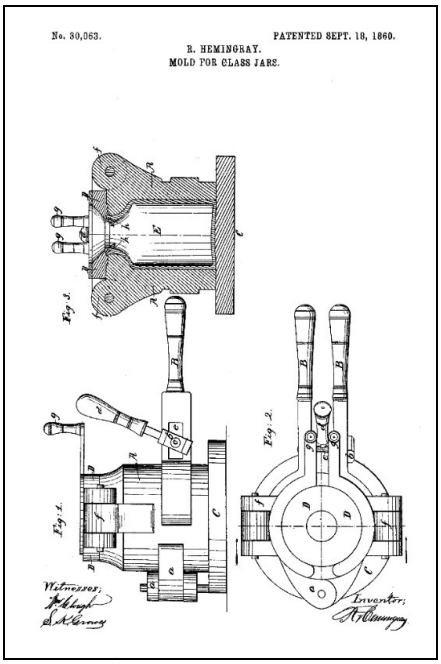
Figure 45 – Mason jars (North American Glass)

Patents

Robert Hemingray and others associated with the various firms received jar-related patents during the period between 1860 and 1890. These appeared on specific types of jars as indicated throughout the following discussions.

September 18, 1860

Robert Hemingray received Patent No. 30,063 for a "Mold for Glass Jars" on September 18, 1860 (Figure 46). This unique four-part mold produced a grooved-ring, wax-sealer fruit jar with side seams that extended to the top of the finish, a circular seam just below the finish, and a circular seam at the top. The rim was ground – the only feature that distinguished the jars made in the mold from machine-made jars. See the section on the Glass Firms at


No. 30,063. PATENTED SEPT. 18, 1860.
R. HEMINGRAY.
MOLD FOR GLASS JARS.
Figure 46 – Hemingray 1860 patent

Greenfield, Indiana, for more details about the various methods used to make grooved-ring finishes. Some of the jars were made of blackglass and had the distinctive Hemingray numbers on the bases.

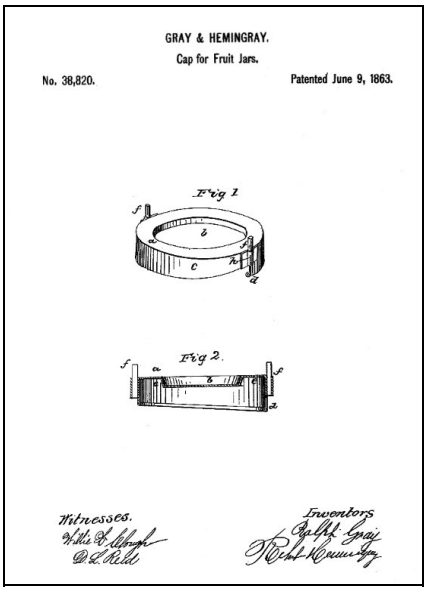

GRAY & HEMINGRAY.
Cap for Fruit Jars.
No. 38,820. Patented June 9, 1863.
Fig 1
Fig 2.
Witnesses.
Inventors.

Figure 47 – Gray & Hemingray 1863 patent

June 9, 1863

Ralph Gray and Robert Hemingray received Patent No. 38,820 for an "Improvement in Caps for Fruit Jars" on June 9, 1863 (Figure 47). The patent document described these lids as made of sheet metal to fit on a continuous-thread finish. The metal lid held a rubber gasket that affected the seal on the rim of the jar. Two short pieces of thick wire were soldered to the sides, rising above the top of the lid, so that a metal bar could be applied to tighten or loosen the lid. Although this was the basic patent used for the seal for the Royal jars, the actual closure was a glass disk held in place by a metal band with two flat (not wire) protrusions. See the discussion on Royal jars above for figures.

February 16, 1864

On February 16, 1864, William Webster received Patent No. 41,657 for an "Improvement in Closing Fruit Cans" (Figure 48). This was essentially a wire arrangement to hold a metal cap onto a grooved-ring finish. The closure was used on a jar embossed "WEBSTER S / PATENT FEB. 16 1864" on one side and "PATENT SEPT 12 1860" in smaller letters on the other (see above). The second patent number is from the Gray and Hemingray patent described above. Although its relevance is unclear, the inclusion of the older patent date ties it to Gray and Hemingray.

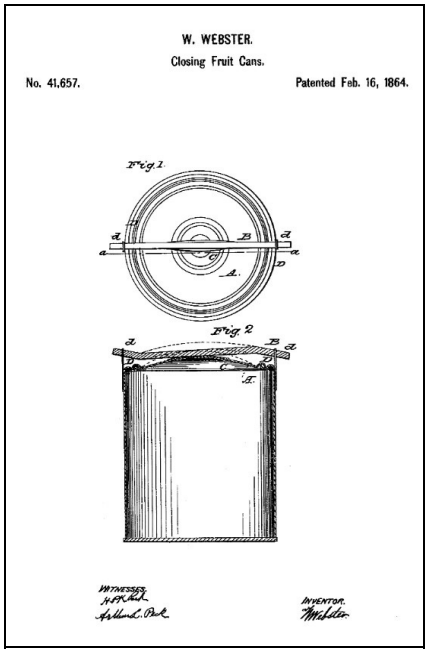

W. WEBSTER.
Closing Fruit Cans.
No. 41,657. Patented Feb. 16, 1864.
Fig. 1.
Fig. 2
WITNESSES.
INVENTOR.

Figure 48 –Webster 1864 patent

June 27, 1865

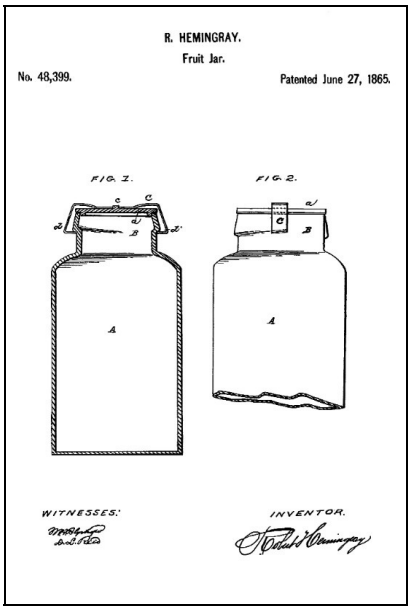


Figure 49 – Hemingray 1865 patent

Figure 50 – 1865 jar (North American Glass)

Robert Hemingray received Patent No 48,399 for an "Improved Fruit-Jar" on June 27, 1865 (Figure 49). The patent called for a metal clamp that held a "cover" in place by hooking onto "a spiral projection or ledge formed upon the neck of the jar, the arrangement being such that by rotating the clamp it operates like the nut of a screwbolt to compress and retain the cap upon the mouth of the jar." It was used on a jar embossed "PATENT / JUNE 27 1865" on the side (Figure 50). Roller (1983:279) discussed the jar and noted two variations: "PATENT / APPL'D FOR" and "PATENTED JUNE 27 1876." Creswick (1987:168-169) added that the jars could have either a metal or glass lid (Figure 51) and illustrated both variations (Figure 52).

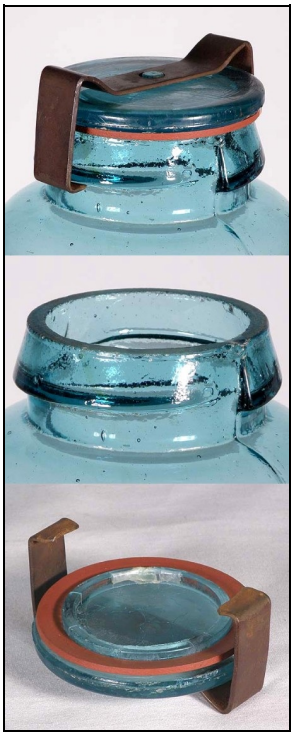


Figure 51 – Lids (North American Glass)

The Roller editors (2011:414) deleted the Patent Applied For variant because they could find no other evidence that one existed. They added that some jars have periods inserted in the patent dates and some do not. We also see that some photos from North American Glass seem to show a period between "27" and "1876," but not between "JUNE" and "27." McCann 2016:277) noted that some of these have been sold with a reproduced closure.

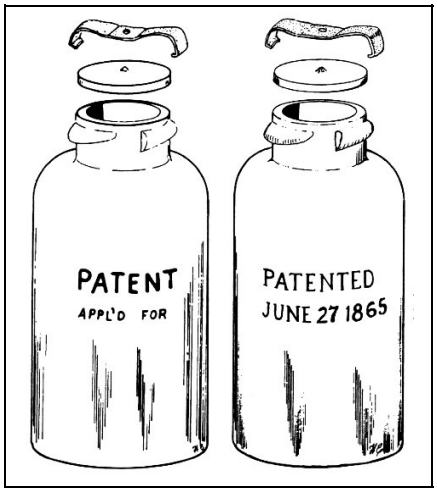


Figure 52 – 1865 jars (Creswick 1987:168-169)

February 27, 1877

Adam Dickey applied for a patent for an "Improvement in Fruit-Jars" on October 25, 1876, and received Patent No. 187,827 on February 27, 1877 (Figure 53). Dickey's main object was to protect the color and quality of the fruit inside the jars by having the jars made of black (actually dark olive) glass. Although he stated that "a fruit-jar of any ordinary construction" would do, he illustrated a Mason-style jar with a closure that fit the one patented by Gray & Hemingray on June 9, 1863, used on Royal jars.

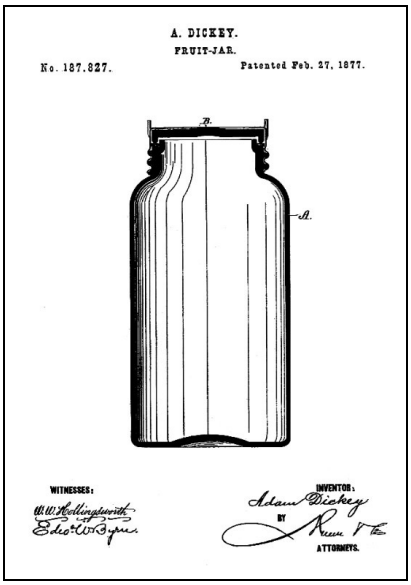

A. DICKEY.
FRUIT-JAR.
No. 187,827. Patented Feb. 27, 1877.
WITNESSES:
INVENTOR:
ATTORNEYS.

Figure 53 – Dickey 1877 patent

May 25, 1886

Robert Hemingray applied for a patent for a "Fastener for Jar-Tops" on February 23, 1885, and received Patent No. 342,602 on May 25, 1886 (Figure 54). Roller (1983:141) described this finish as a "glass lid and wire bail clamp with cast-iron ball-cam lever, bail attached to sheet metal band around jar neck." The patent was the basis for the lid of the Globe jars. See the discussion on Globe jars above for figures.

Insulators

The Hemingray companies were giants in the field of glass insulators (see Figures 3 & 13). The production of lightning rod and other insulators began early in the Gray & Hemingray years and continued throughout the Hemingray period (McDougald & McDougald 1990:64-65). Owens-Illinois bought the company primarily to enter the insulator field and continued production until 1967. Hemingray advertised itself as the "world standard since 1870" (McDougald & McDougald 1990:78). According to the McDougalds (1990:78-79), at least four additional names identify insulators as being made by Hemingray:

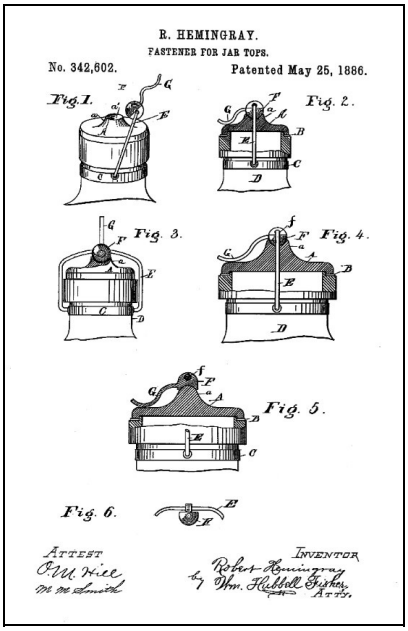

R. HEMINGRAY.
FASTENER FOR JAR TOPS.
No. 342,602. Patented May 25, 1886.
Fig. 1.
Fig. 2.
Fig. 3.
Fig. 4.
Fig. 5.
Fig. 6.
ATTEST.
INVENTOR.

Figure 54 – Hemingray 1886 patent

PROVO (ca. 1900)
MUNCIE TYPE (unknown)
LOWEX (after 1933)
KIMBLE (from 1952)

See McDougald and McDougald (1990:78-83) and Woodward (1988:14-15) for more on Hemingray insulators.

Discussion and Conclusions

Although sources disagree by a year in some cases, the various Hemingray company names have been very precisely dated and provide a basis for dating some of the marks. Although manufacturer's marks for insulators remained in use (albeit with some changes) throughout Hemingray history, marked bottle production is distinctly divided into two periods: late 1870s-ca. 1910 and 1924-ca. 1935. Jars, however, were only made between the 1860s and ca. 1910 (with the possible exception of early wax sealers, possibly from the 1850-1960s). Fortunately for archaeologists, manufacturer's marks are generally unique for each of the periods.

Acknowledgments

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Sources

American Glass Review

1927 *Glass Factory Yearbook and Directory*. American Glass Review, Pittsburgh, Pennsylvania.

1928 *Glass Factory Yearbook and Directory*. American Glass Review, Pittsburgh, Pennsylvania.

1933 *Glass Factory Yearbook and Directory*. American Glass Review, Pittsburgh, Pennsylvania.

1934 "Glass Factory Yearbook and Directory." *American Glass Review*, Pittsburgh, Pennsylvania. Includes reprint of the *Glass Trade Directory for 1904*. Commoner Publishing Co., Pittsburgh, Pennsylvania.

Creswick, Alice

1987 *The Fruit Jar Works, Vol. I, Listing Jars Made Circa 1820 to 1920's*. Douglas M. Leybourne, N. Muskegon, Michigan.

Hemingray.net

2007 "Hemingrey.net: Online Museum." http://www.hemingray.net/index.html

Hyve, H. G. "Bea"

1998 *The Hemingray Glass Co.: A Most Colorful History*. Privately published, San Diego, California. [Bea Hyve is the pen name of Clarice Gordon]

Journal of Industrial and Engineering Chemistry

1913 "The Present Status of the Glass Bottle and Hollow Ware Industries in the United States." *Journal of Industrial and Engineering Chemistry* 5(11):951-954.

Knittle, Rhea Mansfield

1927 *Early American Glass*. Appleton-Century, New York.

Kotlarsky, Shaun

2016 "Hemingray Online Museum." Hemingray.net

Lehner, Lois

1978 *Ohio Pottery and Glass Marks and Manufacturers*. Wallace-Homestead Books Co., Des Moines, Iowa.

Lindsey, Bill

2016 "Historic Glass Bottle Identification & Information Website." http://www.sha.org/bottle/

McCann, Jerry

2016 *The Guide to Collecting Fruit Jars: Fruit Jar Annual, Volume 20 – 2016*. Privately Published, Chicago.

McDougald, John and Carol McDougald

1990 *A History and Guide to North American Glass Pintype Insulators*. Volumes 1 & 2. The McDougalds, St. Charles, Illinois.

McKearin, Helen and George McKearin

1941 *American Glass*. Crown Publishers, New York.

National Glass Budget

1897 "Flint and Green Glass Review." *National Glass Budget* 13(26):4-6.

Owens-Illinois Glass Co.

1933 "Twenty-Sixth Annual Report of Owens-Illinois Glass Company for the Year Ended December 31, 1933." Owens-Illinois Glass Co., Toledo, Ohio.

1943 "Owens-Illinois Handbook: A Compilation of Important Facts and Details Concerning all Phases of the Owens-Illinois Business Structure." Owens-Illinois Glass Co., Toledo, Ohio.

Peterson, Arthur G.

1968 *400 Trademarks on Glass*. Washington College Press, Takoma, Maryland.

Roller, Dick

1983 *Standard Fruit Jar Reference*. Privately published.

1996 "Cincinnati, OH History Notes." Dick Roller files.

1997 "Covington, KY History Notes." Dick Roller files.

1999 "Muncie, IN History Notes." Dick Roller files.

2011 *Standard Fruit Jar Reference: 2011 Update*. Edited by Jerome McCann and Barry Bernas. Fruit Jar Annual/Phoenix Press, Chicago.

Stahr, Bob

2016 "The Hemingray Glass Company, 1848-1972." http://www.hemingray.com/

Thomas Register of American Manufacturers

1905-1906 *The Buyers' Guide: Thomas' Register of American Manufacturers and First Hands in all Lines*. Thomas Publishing Co., New York.

1907-1908 *Thomas' Register of American Manufacturers and First Hands in all Lines: The Buyers Guide*. Thomas Publishing Co., New York.

1909 *Thomas' Register of American Manufacturers and First Hands in All Lines: A Classified Reference Book for Buyer and Sellers*. Thomas Publishing, New York.

1914 *Thomas' Register of American Manufacturers and First Hands in All Lines: A Classified Reference Book for Buyer and Sellers*. Thomas Publishing, New York.

1915 *Thomas' Register of American Manufacturers and First Hands in All Lines: A Classified Reference Book for Buyer and Sellers*. Thomas Publishing, New York.

Toulouse, Julian Harrison

1969 *Fruit Jars*. Thomas Nelson & Sons, Camden, New Jersey.

1971 *Bottle Makers and Their Marks*. Thomas Nelson, New York.

Van Rensselaer, Stephen

1969 *Early American Bottles and Flasks*. Rev. Ed. J. Edmund Edwards, Stratford, Connecticut. [Revision of the 1926 edition]

Von Mechow, Tod

2016 "Soda & Beer Bottles of North America: Bottle Attributes - Beer & Soda Bottle Manufacturers." http://www.sodasandbeers.com/SABBottleClosures.htm

Whitten, David

2016 "Hemingray Glass Company." http://www.glassbottlemarks.com/hemingray/

Woodward, N. R.

1988 *Glass Insulator in America: 1988 Report*. Privately Printed.

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