

The Dating Game: Tracking the Hobble-Skirt Coca-Cola Bottle

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Frequently, the story of *why* an article was written is almost as informative as the actual publication. In this case, the tale will at least set the scene and explain why we are presenting what may seem like old information in a new package.

It began with a phone call and a question (neither of us remembers *what* question) that began a series of discussions that has lasted for years. As a member of the Bottle Research Group, Bill Lockhart (NM Bill or New Mexico Bill) was investigating manufacturer's marks on bottles, and Bill Porter (MD Bill or Maryland Bill) was (and is) a devoted researcher on the subject of hobble-skirt Coca-Cola bottles. Topics of discussion have ranged from the obvious (the development of hobble-skirt Coke bottles) to technical details (like discovering the system of date codes used by the Graham Glass Co.).

Eventually, the questions concerning the development of the Coca-Cola bottle began to accumulate. As with most topics, there seems to be misinformation, misunderstanding, and just plain mistakes in the existing literature. The farther we looked, the more fresh questions arose. Norman Dean's new book *The Man Behind the Bottle* answered some questions, but it, too, raised additional points. The following is an attempt to sort out some of these issues.

The Invention

Although Munsey (1972:57) made the same identification almost 40 years earlier, Dean (2010:23-28) presents compelling evidence that his father, Earl R. Dean, was the designer (inventor) of the universally recognized and quite distinctive Coca-Cola bottle. Called the contour bottle by the Coca-Cola Co., and both the "Mae West" and "hobble-skirt" bottle by collectors, archaeologists, and drinkers, this is clearly the most recognized package in the world.

The story began when the Coca-Cola Co. felt the need for a standardized Coke bottle. The main office was concerned at least as early as 1913, when it ordered all Coke bottles to be standardized. Prior to that time, each franchise ordered its

own bottle and pretty much created its own design. Called "straight-sided" Coke bottles by collectors, these containers used different combinations of embossing and paper labels to identify the bottlers and the product. The 1913 edict required each bottle to be embossed with the script Coca-Cola logo on each shoulder and another on the base – as well as a standardized paper label at the center of the bottle. The bottler was free to emboss its own name and location on the heel of the bottle.

This edict was duly carried out by most of the manufacturers, but, since the "standardized" design was not patented, imitators simply copied it, and the change proved to be ineffective. An entirely new bottle was required, one that would qualify for a "design patent," one that could be legally protected.

At a bottlers' convention in 1914, Harold Hirsch requested a "bottle that we can adopt and call our own child" (Pendergrast 1993:105). Benjamin Thomas suggested "a distinctive package that will help us fight substitution. . . . a bottle that people can recognize . . . in the dark . . . so shaped that, even if broken, it would be recognized at a glance for what it is" (Munsey 1972:57). In 1915, the Board of Directors agreed to the development of a completely unique package.

The firm contacted several glass houses, offering a contest for the best design for the Coca-Cola bottle. The design had to be distinctive both to the eye and the touch. This would replace the bottles with straight sides and either the bottler's name embossed on the side of the bottle, a paper label affixed to the front, or both. Since the main method for cooling bottles was to immerse them in ice, the drinks were often not in plain sight of customer, and the labels frequently washed off as the ice melted. Coca-Cola wanted a bottle that the consumer could identify by touch alone. One of the firms that joined in the contest was the Root Glass Co.

Chapman J. Root, president of the Root Glass Co., called a meeting at the Root factory with his company

auditor, T. Clyde Edwards; Alexander Samuelson, the plant superintendent; and Earl R. Dean, a bottle designer, machinist, and engraver. Root explained the situation, setting the process of invention in motion. Dean drew a design for the bottle, based on the shape of a cocoa pod (Figure 1).



Figure 1 – Dean's drawing of the prototype bottle
(Dean 2010:36)

Samuelson signed the patent document, and the prototype Coca-Cola bottle began its life (for the story in *much* greater detail, see Dean 2010).²

In 1971, the Coca-Cola Co. commissioned the Owens-Illinois Glass Co. to make a mold from the original prototype bottle. The glass house manufactured 5,000 reproduction bottles embossed "1915-1965" on the bases. Although made a bit late, these bottles commemorated the 50th anniversary of the hobble-skirt bottle (Munsey 2001). Few of these remain in circulation. However, the company allowed another reproduction in 1999, and these bottles are common (Figure 2). The bases of these newer reproductions are embossed "© 1999 THE COCA-COLA / COMPANY (both arched) / ALL RIGHTS / RESERVED (both inverted arches)" on the bases. The bottles have no manufacturer's marks.

Root approved the bottle, and Dean fashioned a mold for it. Placed on one of the Johnny Bull machines at the Root factory, the mold was used to make a few prototype bottles.¹ Oddly, Root's attorney only took Dean's drawing of the back of the bottle to the patent office, along with Alexander Samuelson, the plant superintendent.

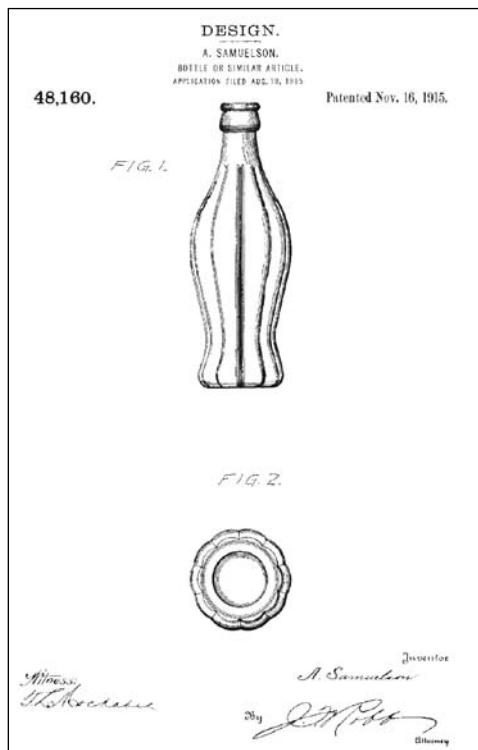


Figure 2 – 1916 patent drawing of prototype bottle

The First Patent

Alexander Samuelson, of Terre Haute, Indiana, officially applied for a patent on August 18, 1915, and received Design Patent No. 46,180 for a "Design for a Bottle or Similar Article" on November 16, 1915. He assigned the patent to the Root Glass Co. In design patent applications, the drawings tell the story (Figure 3), but some of the text is worth repeating. Samuelson stated that he had "invented a new, original, and ornamental Design for Bottles or Similar Articles." The document clearly stated that the "Term of patent" extended for "14 years."

It is important to note that the bottle in the drawing does not include the labeling area that appears on the actual prototype bottle or later Coca-Cola bottles. The "bulge" in the center is much more pronounced than those on the bottles actually used by the company, and the circumference of the base is much smaller (Figure 4). The bottle in the drawing was never used. According to Dean (2010:29), his father made all the alterations to the



Figure 4 – Comparison of 1916 patent drawing with actual bottle

shape to make the bottle much more stable. Earl Dean further stated that "of the four individuals most connected with the development of the bottle . . . Samuelson had the least to do with it" (Dean 2010:28).

Although probably not a pertinent point, there is no clear consensus as to whether the Coca-Cola Co. actually adopted the prototype bottle or the modified container. Clyde Edwards implied in 1949 that the modified bottle was submitted to Coke. Earl Dean, however, made it pretty clear in his 1971 interview that the Coca-Cola main office selected the prototype, and Dean modified it later (Dean 2010:30, 44). It is certain, however, that the prototype was the bottle that was patented, but the modified bottle was the one actually produced.

An interesting aside has to do with the bottle color. According to Allen (1994:112), George Hunter wanted to make the new bottles from amber glass, but, after a protracted dispute, Veazey Rainwater succeeded in setting the standard at a "light green" or aqua color. Munsey (1972:60) agreed that the light green was chosen and was eventually called "Georgia-green" – but there were many exceptions (including



Figure 3 – Reproduction of prototype bottle

colorless and various shades of greens and blues), especially during the early days of hobble-skirt production.

Both Munsey (1972:58) and Dean (2010:33) stated that Coca-Cola assigned the Root Glass Co. as the sole manufacturer of the bottle for the first year. This has to be pure myth, developed at some point by someone who misunderstood the patent system. Samuelson received the patent. As an employee, he assigned the patent to the Root Glass Co. Root, then, had *total* control of the patent – and the bottle. Root – *not* Coca-Cola had the total say about who did or did not make the bottle. This point cannot be stressed too strongly. The patent and all manufacturing rights pertaining to it rested *only* with the Root Glass Co.

Both Munsey (1972:58) and Dean (2010:33) also stated that Root was awarded five cents per gross for all Coca-Cola bottles manufactured by other glass houses. Allen (1994:112–113) and Dean (2010:33) added a story, possibly apocryphal, that Harold Hirsch proposed offering Root 25¢ per gross, but Root declined in order to keep the cost of the bottles down. His thinking, as reported, was that the cost would be passed on to the bottlers, who would rebel at the higher cost and continue using the older, straight-sided bottle – thereby actually losing money for Root. As noted above, the Root Glass Co. – *not* Coca-Cola – owned the patent rights. It is very unlikely that anyone awarded Root anything. Chapman Root almost certainly set his own royalties.

The story, however, probably has a factual basis that was lost in the telling. Once Coca-Cola adopted the hobble-skirt bottle, Chapman Root certainly knew he had acquired a gold mine, although one made of glass. He probably toyed with the idea he could charge an outrageous royalty or commission – then realized that the bottlers would only tolerate a certain level of cost. On the other hand, the potential market was immense, so a lower royalty would pay off in big profits in the long run. And that market grew larger than he probably ever imagined.

As always, one misunderstanding leads to others. Dean (2010:33) implied that five-cent royalties were attached to the 1915 patent. If so, those commissions

went to the Root *company*. Munsey (1972:58), however, discussed the 1923 patent and stated that “for the next fourteen years The Coca-Cola Company paid Root a five-cent royalty on every gross of bottles manufactured.” In other words, Munsey tied the royalties to the 1923 patent, paid to Chapman Root, personally. As explained above, Root already had the rights to the 1915 bottle. In addition, Chapman Root personally patented the 1923 bottle – acquiring total rights to that one, too. But, this second time, those rights were in his own name. Again, Root set the price to the other glass houses. Coca-Cola had little control.

The power and control issues, however, need a bit more discussion. Other researchers began with the assumption that the Coca-Cola Co. held all power connected with the hobble-skirt bottle. Our discussion above gives the impression that Root Glass Co. held total power. In reality, the power was more likely shared. Root had all rights to the *production* of the bottle, but Coca-Cola had the rights to the *adoption* of the container. This created a balance of power, and the agreements that governed that balance were certainly set between Chapman J. Root and the principals of the Coca-Cola Co. This balance may have had interesting ramifications in the adoption of the 1923-patent bottle.

Dean (2010:135) brought up another interesting point. Only the actual inventor of a design may be issued a patent. Conversely, for a patent to be valid, *all* inventors must be listed on the document. This suggests that at least the first patent, probably the second one, and possibly the third patent were taken out illegally and might not have withstood a serious challenge. With Dean’s evidence, there is virtually no question that his father, Earl Dean, designed the first and very likely the second bottle shown in the patent drawings. It is clear that neither Samuelson nor Root (in the case of the second patent – see below) deserved an identification as the sole inventor.

Further, Dean (2010:135) discussed that the employer owns the patent if the designer creates the design while on the job. Since Dean was in the employment of Root, the original patent was correctly assigned to the Root Glass Co. The assignment of the second patent

to Chapman Root – the individual, not the company – may also be called into question.

The First Year

Although we have exploded the myth of Coca-Cola controlling the royalty, we still need to test whether the Root Glass Co. maintained sole manufacturing rights for the first year. As noted above, both primary researchers of Coke bottle history thought that Root was granted exclusive rights to manufacture the hobble-skirt bottle during the first year of production. We have found no source that states *when* that very important year started. There is not even a solid consensus on when production of the bottle commenced and whether that date is also the date when Root’s “year” of exclusive manufacturing rights began.

Using records from the Coca-Cola main office, Munsey (1972:62) implied that the new, hobble-skirt bottles were first made during 1916. The Coca-Cola firm, indeed, provided a newspaper ad to the franchises in 1916 to help promote the new bottle. The ad carried the message that Coca-Cola impersonators “cannot imitate the new Coca-Cola bottle—it is patented” (Dean 2010:131).

Dean (2010:141) also noted an ad in the *National Bottlers Gazette* that announced – to the rest of the glass container manufacturers—the introduction of the contour bottle on April 5, 1917. The ad stated that “Genuine bottled Coca-Cola is now sold in a new-shaped bottle—as per our fac-simile illustrated herewith.” The main office crowed that “every Coca-Cola bottler will welcome this new and distinctive package . . . [as] protection against infringers and would be infringers.” An October 1916 letter from Coca-Cola on display at the museum in Elizabethtown, Kentucky, also states that “the new bottles should be available by early spring” (i.e., spring 1917).

Munsey (1972:58) and Dean (2010:105), however, both observed that most bottlers needed to exhaust their supplies of the older, straight-sided bottles prior to adopting the new style. Thus, the hobble-skirt bottle was phased in over time rather than immediately replacing the existing containers. Because of this, the Coca-Cola Co. did not advertise the bottle to the general

public until “its 1918 calendar, and later in magazine and newspaper ads” (Dean 2010:105). Virtually, all bottlers had adopted the hobble-skirt bottle by 1920, although Kendall (1978:7) claimed that a few hold-outs *never* used the 1915-patent bottle, waiting until the second, 1923-patent bottle was available.

These ads mentioned above suggest that the bottles were not intended to be used by the franchises until the April 1917 debut. Other researchers (e.g. Gilborn 1968:15; Kendall 1978:7; Pollard 1993:45) have also claimed a 1917 date for the initial manufacture of the first bottle. We, too, have found no evidence that *any* hobble-skirt bottles were produced in 1916.

The Message in (or on) the Bottle

The bottles, themselves, provide a considerable amount of empirical evidence – evidence we can see and feel. While we have discussed this aspect along with much of the documentary evidence so far, many bottles were embossed with extra information that bears on this story. In the mid-1990s, Ben Napier, a former employee of the Chattanooga Glass Co., provided Bill Porter with a list of “directives” that Coca-Cola sent to the glass houses. These directives set up a chain of physical evidence – embossed clues opening up new interpretations for the early events surrounding the hobble-skirt bottles.

The Coca-Cola Co. sent a blueprint drawn by C.W. Mourey to various glass houses, including the Chattanooga Bottle & Glass Co. (as described in Napier’s directives). Dated August 16, 1916, this almost certainly marks the earliest transmission of bottle details to any companies other than Root. It also demonstrates that glass houses – aside from Root – had the *capability* to make the bottles by that time.

Coca-Cola sent a revision to the glass houses on May 13, 1918. From that point on, the city and state of each bottling plant was to be embossed on the bases of Coca-Cola bottles to maintain a record of plants that bottled Coca-Cola and ascertain that bottles were being sold only to authorized bottlers (Figure 5). This was a logical extension of previous practices in the soda bottling industry in general and reflected the typical bottler information on the earlier, straight-sided Coke bottles.



Figure 5 – City/State designation on early base

During the ca. 1880-ca. 1906 period, when Hutchinson soda bottles were the industry standard, the bottles were cased for delivery with the finish end of the bottle down to keep the seal moist and prevent leakage. Since the base of the bottle was thus exposed, many bottlers began having glass houses engrave the name or initials of the bottling company on the base of the mold. A dealer could thereby tell at a glance whether a case of empties contained any “foreign” bottles (i.e., ones belonging to another bottler).

With the adoption of crown-topped bottles, packed upright in a case, the need for basal embossing of company names was lost, but the practice continued. Some bottlers added the city and state location to their names or initials on the bases; others just used the city/state designation. Coca-Cola merely formalized the practice in May of 1918.

Another letter from Coca-Cola, dated July 23, 1919, required both a manufacturer’s mark and the year of manufacture to be embossed on the heels of the containers “so cut that they will not disturb the conveying of the bottle” although they had to be “prominent enough to be seen under careful inspection.” Thus, glass house date codes and manufacturer’s marks were not required until after July 1919, and the city/state designation should also be present.

Two glass houses in particular used their own logos and other codes on hobble-skirt bottles prior to the 1919 Coca-Cola requirement. Of great importance, the Root Glass Co. used date codes embossed on the heels of its soda bottles beginning in 1909. Also embossed on the heels was the ROOT logo and, usually, a model

code (Figure 6). We have found a few Root hobble-skirt bottles embossed with the “17” (1917) date codes but none from 1916. However, date codes for 1917 and 1918 are uncommon. Beginning in 1919, the numbers of hobble-skirt bottles made by Root increased.



Figure 6 – Example of Root Glass Co. logo (straight-sided bottle)

Unfortunately, most early manufacturers did not include their logos or date codes on hobble-skirt Coke bottles until the July 1919 requirement from the main office. Thus, these bottles with no manufacturer’s marks or date codes can only be dated between 1917 and 1919 – although there is no guarantee that every glass house complied with logo and date code requirements at all times.

We thus have a limited guide for dating the early bottles:

1917-May 1918 – no manufacturer’s mark, date code, or city/state marking
May 1918-July 1919 – city/state marking is present – but no manufacturer’s mark or date code

July 1919-1930 – manufacturer’s mark, date code, and city/state marking are all present

It should be noted that this was not practiced perfectly, and there are exceptions of various kinds throughout the entire history of the 1915-patent bottle. It is also important to realize that none of these dates is absolute. For example, some glass houses embossed their logos but no date codes on some bottles without city/state designations. Those may indicate a manufacture during the 1917-1918 period, even though the glass house mark is present. Very little in bottle dating is ever absolute. However, this guideline gives us at least some broad generalities to use when looking at bottles made by specific glass houses.

Root Glass Co.

The Root Glass Co. was incorporated on May 10, 1901, and occupied two factories in Terre Haute,

Indiana. The first, completed November 1901, was for the manufacture of soft drink bottles, and the second made fruit jars. The jar business, however, was short lived, and Root concentrated on soda bottles after 1909. Root began developing its own semiautomatic machine as early as 1905 and had shifted almost entirely to machine-made bottles by 1912.

Root specialized in proprietary soft drink bottles (Figure 7). Called specialty bottles by the glass industry and deco bottles by collectors, these were elaborately designed containers, specific to individual brands of soda. Along with the hobble-skirt Coke bottles, Root also made bottles for Whistle, Orange Crush, Chero-Cola, and a particularly elaborate design for Bludwine – as well as many others.

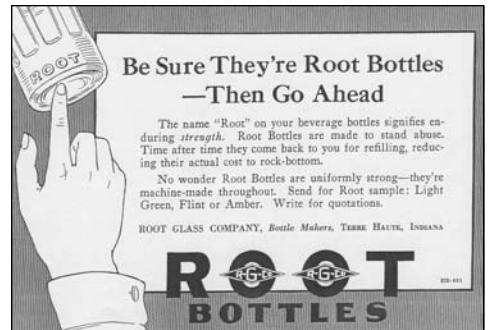


Figure 7 – Root Glass Co. ad run from 1924 to 1946 (Glass Container)

Root became Plant No. 25 of the Owens-Illinois Glass Co. in 1932. Although the company retained the Root name for the next two years, the plant ceased production of hobble-skirt bottles when it became part of Owens-Illinois.³ The factory continued to produce glass for Owens-Illinois until 1938 when it was shut down. It was reactivated in 1942 but was again idled in 1948 and was used as a warehouse when not active. As noted elsewhere, Root made 1915-patent bottles from 1917 to 1930.

Graham Glass Co.

The Graham family entered the bottling business in 1904, with the acquisition of the Lythgoe Bottle Co. at Loogootee, Indiana. After incorporating as the Southern Indiana Glass Works, the Grahams began mechanizing by buying a Johnny Bull machine and inventing one of their own. They expanded in 1910, opening a new plant at Okmulgee, Oklahoma, followed by another at nearby

Chacotah the following year. In 1912, the Grahams bought the Citizen's Glass Co. at Evansville, Illinois, and renamed their venture the Graham Glass Co.

The Graham machine was successful, and the firm specialized in soda bottles. On June 28, 1916, the Owens Bottle Co. bought the entire Graham Glass operation but continued to run it under the Graham Glass Co. name. Owens sold the Chacotah plant in 1923 and closed the Loogootee factory in 1926. When Owens merged with the Illinois Glass Co. in 1929, the new firm closed the Okmulgee plant. The Graham tenure was at an end.

Like Root, Graham Glass included both its factory identification and its unique code system on virtually all its bottles. Graham generally embossed four codes on its bottles. First (usually) came the factory code. This was a single letter (two, in the case of Checotah):

L – Loogootee, Indiana
E – Evanston, Illinois
O – Okmulgee, Oklahoma
CH – Chacotah, Oklahoma

This was usually followed by either a G, P, or S. While G somewhat obviously means Graham (although it could mean General), we have conjectured that P may indicate Proprietary, and S equals Standard – although we have considered several other interpretations. All are speculation. At this point, we simply do not know. These are usually followed by a 1- to 3-digit model code.



Figure 8 – Graham Glass Co. logo, Evansville factory, with letter date code (R = 1918)

Beginning in 1916, Graham added a unique date code system (Figure 8). These codes were based on letters, starting with "P" – the 16th letter of the alphabet:

P = 1916
Q = 1917
R = 1918
S = 1919

At the beginning of 1920, Graham adopted a two-digit, numerical date code (Figure 9). Oddly, when the firm used the



Figure 9 – Graham Glass Co. logo, Chacotah factory, with both letter (S = 19) and numerical date code (21 = 1921)

old molds, the engravers often added the two-digit code to the right while leaving the older letter-code in place. Since the firm also frequently just stamped a new final digit over an existing one when it updated the mold for the next year, we sometimes have somewhat of a process history on a single bottle.

The story told by the Graham codes does *not* fit with the existing Coca-Cola histories. We have discovered several bottles with an LSQ heelmark. These were made at Graham's Loogootee plant, and the "Q" code indicates that they were made in 1917! The implication here, of course, is that *both* Root and Graham were making hobble-skirt bottles in 1917.

The 1917 Graham date codes question the exclusive manufacture by Root. As we have demonstrated above, the story of Root being given exclusive manufacture is apocryphal; Root already owned the patent. So, why did Root allow Graham (and others – see below) to make hobble-skirt bottles during the first year? While not intuitively obvious, the answer was probably tied to the production of other soda bottles. Root was probably already operating at close to full capacity in 1917 and simply did not have sufficient resources to handle the tremendous demand for Coke bottles. The obvious solution was the royalty system.

The rest of the Graham story is worth discussing. In both Coke bottles and other soda bottles, we have found more "Q" (1917) codes than "R" (1918) codes. In fact, Graham codes for 1917 outnumber the total 1917 production of hobble-skirt bottles by Root! There are two plausible explanations for this phenomenon. First, the "Q" code may be a "frozen" date code. In other words, bottles with the "Q" code may have actually been made in both 1917 *and* 1918 – possibly even into 1919.

Second, following up on the idea that Root had insufficient resources to

fill all the early orders, Graham may have received so much business that the Loogootee plant made a huge number of the earliest bottles – much more than Root. Thus, the "Q" code really *does* always indicate 1917.⁴ However, Graham apparently shifted production of Coke bottles from Loogootee to Evansville at the end of 1917, although few soft drink bottles seem to have been produced in 1918 – anywhere. The U.S. involvement in World War I in 1918, the heaviest American participation of the entire conflict, probably played a large part in the reduced production. Because of shortages and rationing, it is also likely that bottles were used by each franchise until they completely wore out or were broken. Thus, there were fewer left to appear in current collections.

In 1919, bottles with the "S" date code were mostly made at the Evansville plant, although production shifted to Okmulgee for the western bottles in the early 1920s. Some of the molds were transferred from Evansville to Okmulgee and show where the "O" had been stamped over the "E" for the plant code. Okmulgee ceased production of Coke bottles in 1926, but Evansville still made 1915 Coke bottles the following year. Orders must have been especially heavy in 1921. During that year alone, the "CH" code is found on hobble-skirt bottle heels, suggesting overruns sent to the smaller plant. For more information about the Graham marks, see Lockhart 2006a or Lockhart & Miller 2007).

The above data suggest two very interesting conclusions – that do not support the statement that the Root Glass Co. enjoyed an exclusive manufacturing right for the initial year of production. First, initial production of hobble-skirt bottles likely began in 1917, probably in April. Second, at least two bottlers (almost certainly more – see below) began production in 1917, and Graham Glass seems to have been the most prolific.

The "Second Year"

According to Dean (2010:33-34), Coca-Cola licensed six additional glass houses to make hobble-skirt bottles at the beginning of the second year:

American Glass Works, Richmond,
Virginia
Chattanooga Bottle & Glass Mfg. Co.,

Chattanooga, Tennessee
 Graham Glass Co., Evansville, Indiana
 Laurens Glass Works, Laurens, South Carolina
 Lynchburg Glass Works, Lynchburg, Virginia
 Pacific Glass Works, San Francisco, California

Once again, empirical evidence questions the assumptions implied by these companies being involved in the “second year.” To reiterate from the documentary and empirical evidence presented above, it is highly likely that production of the hobble-skirt bottle first began commercially in early to mid-1917. Therefore, the “second year” would have begun in early 1918. To test this idea, we need to look at the histories of the six glass houses and what we currently know about their bottles and their logos.

Of these six firms, only the Graham Glass Co. used date codes prior to the Coca-Cola edict of 1919. Since Graham was discussed above, it will not appear in the following analysis. Several also did not emboss their company logos on hobble-skirt bottles until 1919. Fortunately, however, most of the these companies left evidence that allows us to trace at least some of the unmarked bottles to specific glass houses. We can also assess when each firm began using date codes and when some of them ceased production of the contour bottles.

American Glass Works

The American Glass Works opened in 1908 at Richmond, Virginia. The plant originally made medicinal bottles for Sauer’s Extract, a company also run by C.F. Sauer, the glass house owner. Eventually, the factory made a general line of bottles, including soda bottles. The plant had at least one machine by 1916. About 1919, the American Glass Works bought out the Duquesne Glass Co. at Paden City, West Virginia, but the Richmond plant burned in 1925 and was not rebuilt. The Paden City factory made essentially the same products and remained in business until ca. 1935.

Mouth-blown bottles (also called Blown In Mold or BIM) were embossed with a two- or three-digit number placed below the glass house logo (e.g., A.G.W. / 133). Machine-made bottles, however, were embossed with a one- or two-

digit number, a dash, then a single-digit number, beneath the mark (e.g., A.G.W. / 67-5). We have only discovered a single hobble-skirt bottle embossed with a city/state designation on the base. However, there are numerous examples embossed with the A.G.W. basemark and American’s typical machine-made numerical code (Figure 10).



Figure 10 – Typical machine-made base, American Glass Works (eBay)

These numbers deserve some discussion. On the mouth-blown bottles, the typical three-digit number was almost certainly a model or catalog code. The double code on machine-made bottles is not as easy to explain. The first two digits (to the left of the dash) may be model codes or mold numbers. We have recorded those in a range from 9 to 75 so they cannot be date codes. The numbers to the right of the dash, however, are always single digits between 1 and 5. These *may* be date codes from 1921 to 1925.

Our single hobble-skirt bottle with the city/state designation was almost certainly made in 1919, shortly after the Coca-Cola Co. issued the requirement. The others may have been made prior to that time. Since these are fairly common, at least some were most likely made at least as early as 1918. We may never know why the American Glass Works apparently dropped Coca-Cola bottle production early. If, indeed, the single digits on the bottle bases are date codes, the company may have stopped making soft drink bottles when the Richmond plant burned.

Chattanooga Bottle & Glass Co.

The Chattanooga Bottle & Glass Co. opened at Chattanooga, Tennessee, in 1901. The plant may have begun machine production as early as 1910 and was certainly mechanized by 1913. The factory

made a variety of bottle types, although it specialized in soda and beer bottles. The firm’s first expansion occurred in 1917, when it bought the Tallapoosa Glass Co., Tallapoosa, Georgia.

In 1930, the firm became the Chattanooga Glass Co. It absorbed the Florida Glass Mfg. Co., Jacksonville, Florida, in 1947 and opened a branch plant at Corsicana, Texas, in 1958. Chattanooga became a subsidiary of the Dorsey Corp. in 1960, although the unit continued to operate as the Chattanooga Glass Co. Although the plant remained in operation when the Container General Corp. took over in 1983, it no longer retained its own identity (Lockhart 2006b).

The earliest date code on a hobble-skirt bottle made by the Chattanooga firm was 1920, placed to the right of the company logo “CHATT” on the heel (Figure 11). The “CHATT” mark was used until mid-1934 on the heel of the bottle. In 1934, it was replaced by the Circle-C (©) logo (Figure 12), which appeared on the bottle skirt.⁵ The Circle-C was moved from the skirt to the base in 1951. (Interestingly, the Circle-C appeared on the base, briefly, in 1927, and, on a few 1926-dated bottles, a very small Circle-C was embossed on the neck.)

But neither date codes nor manufacturer’s marks tell the full story. The documents provided by Ben Napier include the original requirement by the



Figure 11 – CHATT heelmark, Chattanooga Glass Co.



Figure 12 – Chattanooga Glass Co. Circle-C (©) logo

Coca-Cola Co. to use the C.W. Mourey blueprint for the 1915-patent bottle. That edict, dated August 16, 1916, was sent to the Chattanooga Bottle & Glass Co. There would have been no reason to send that message to Chattanooga – unless the Chattanooga plant had been selected for the production of original hobble-skirt bottles.

Although we have no absolute proof, we believe that early hobble-skirt bottles made by the Chattanooga Bottle & Glass Co. are distinguished by very large-letter bases (as were later bottles made by the glass house), and/or by a period after 1915 located as much as a millimeter to the right, and by large, rather thin side letters. In addition, the bottles are blue in color, are well made, and are heavy. These early bottles were very common; Chattanooga was at least as prolific as Graham. We thus submit that Chattanooga was also one of the original manufacturers of the 1915-patent bottle in 1917.

Chattanooga rapidly became one of the largest makers of hobble-skirt bottles. It is virtually certain that Chattanooga Glass only began the use of date codes because of the Coca-Cola requirement. The firm was one of the last hold-outs, eschewing date codes on its non-Coke bottles until forced to comply by federal law changes in the 1970s.

Laurens Glass Works

Although Laurens Glass Works began production in 1911, it shut down later that year and did not reopen until 1913. Although the plant soon specialized in soda bottles, it did not begin machine manufacture until ca. 1919. Laurens added date codes to its “LGW” logo in 1919 – almost certainly because of the Coca-Cola requirement (Figure 13). Unlike Chattanooga, Laurens used date codes for the rest of its tenure in business. Like Chattanooga, however, the South Carolina firm also became a major hobble-skirt bottle producer.

Laurens holds the distinction of being the only factory to manufacture mouth-blown hobble-skirt bottles. These were sky blue in color, and we have recorded examples with city/state codes only for Florida, Georgia, and both Carolinas. Many of the Laurens bottles were made without city/state basal designations. These (especially the mouth-blown bottles) may have been produced in 1917.



Figure 13 – Laurens Glass Works heelmark (eBay)

Others have the city/state designations – but the lack of manufacturer’s marks or date codes. These bottles probably fit best between May 1918 and July 1919. At least one machine-made bottle was probably produced in late 1919. This example had no city/state codes but lacked punctuation after “NOV. 16” and “1915” – a characteristic also found in the mouth-blown bottles.

Lynchburg Glass Works

The Lynchburg Glass Works, Lynchburg, Virginia, began production about February 1919 and probably made Coke bottles from its inception. The firm embossed its “Lbg” logo on the heels of 1915-patent Coke bottles that were a smoky grey in color (Figure 14). We have only discovered a single “20” (1920) code on a Lynchburg bottle. The plant burned in 1921 and never resumed bottle manufacture (although it continued to make insulators and jars). Some bottles were embossed with “Lbg” on both heel and base but have no date codes. These were probably made during 1919.

Pacific Glass Works

The final glass house on the “second year” list was the Pacific Glass Works, San Francisco. This was apparently the



Figure 14 – Lynchburg Glass Works “Lbg” logo

firm expected to carry the West Coast business for Coca-Cola, but there is something amiss here. The Pacific Glass Works was only open between 1862 and 1875. The Pacific Coast Glass Works was open from 1902 to 1924 and was followed by the Pacific Coast Glass Co. (1924-1930). This was probably the firm intended by the list. Pacific Coast Glass used several logos over the years, but we have never seen a single one on a Coca-Cola bottle.

The “Third Year”

Dean (2010:34) further stated that Coca-Cola broadened the number of glass houses licenced to make the bottles in the third year. However, aside from the single bottle made by the American Glass Co., we have only discovered a total of nine glass houses that made the 1915 bottle (see Table 1). Although we are discussing the

Table 1 – Early Hobble-Skirt Bottle Makers (1916 patent)

Manufacturer	Location	Dates*
Root Glass Co.	Terre Haute, Indiana	1917-1930
Graham Glass Co.	Loogootee, Indiana	1917**
Graham Glass Co.	Evansville, Indiana	1918-1927
Graham Glass Co.	Oklmulgee, Oklahoma	ca. 1920-1926
Graham Glass Co.	Chacotah, Oklahoma	1921
Laurens Glass Works	Laurens, South Carolina	1917-1928
Chattanooga Bottle & Glass Co.	Chattanooga, Tennessee	1917-1927
Obear-Nester Glass Co.	East St. Louis, Missouri	ca. 1918-ca. 1919
Lynchburg Glass Co.	Lynchburg, Virginia	1919-1920
Southern Glass Co.	Vernon (Los Angeles), California	1919-ca. 1926
F.E. Reed & Co.	Rochester, New York	1920-1927
Illinois-Pacific Glass Corp.	Los Angeles, California	ca. 1926-1929

* Dates of production of 1916-patent hobble-skirt bottles are based on empirical evidence.

** Some hobble-skirt bottles were made at Loogootee after 1920, but these were probably overruns – where the other factories could not keep up with production.

glass houses not included in the “second year” list below, they do not necessarily fit into that temporal order.

Obear-Nester Glass Co.

Although not generally noted for making soft drink bottles, the Obear-Nester Glass Co. was located at East St. Louis, Illinois, from 1894 to 1978. At least nine 1915-patent Coca-Cola bottles were embossed on the heels with “ON” followed by a one- or two-digit number between 5 and 24. The bottles were made for Coca-Cola franchises at Kansas, Louisiana, Arkansas, Illinois, and Iowa – all states adjacent to the Obear-Nester plant at East St. Louis.



Figure 15 – Obear-Nester O-N logo

None of the Coke bottles had date codes, but most had city/state designations, so they were probably made between 1918 and 1919. At least one lacked a city/state marking and may have been made slightly earlier. We have also found crown-topped, non-Coke bottles embossed “O-N” in larger letters on the heels, followed by single-digit numbers (Figure 15). Despite a thorough search through the bottle literature, we have been unable to find any other glass company with initials that even came close to “ON.” Thus, it appears that Obear-Nester was one of the early hobble-skirt Coke bottle manufacturers.

F.E. Reed Glass Co.

Although it grew out of several earlier companies, the F.E. Reed Glass Co., Rochester, New York, was in business under that name from ca. 1909 to 1947. The firm made a general line of bottles and had semiautomatic machinery by at least 1913. All but a few specialty items were machine made by 1922. The company incorporated in 1947 as the Reed Glass Co., Inc. and remained in operation until 1956.

As with most glass houses that were in business for many years, Reed used several manufacturer’s marks. Some Reed hobble-skirt bottles lack the city/state designation on the base. Most of the 1915-patent bottles, however, were



Figure 16 – Example of REED heelmark (not a Coke bottle)



Figure 17 – Example of R-in-a-Triangle (not a Coke bottle)

embossed “REED” on the heel followed by a two-digit date code (Figure 16). Our sample includes date codes from “20” (1920) to “25” (1925). From 1923 to 1926, 1915-patent bottles were embossed with REED on the heel and R-in-a-Triangle on the bases.⁶ All of the 1923-patent bottles had the triangle mark (Figure 17). Reed only made hobble-skirt bottles for New York Coca-Cola franchises and a few in surrounding states (New Hampshire, Ohio, and Pennsylvania).

Southern Glass Co.

Located at Vernon (Los Angeles), California, the Southern Glass Co. began production in 1919. Specializing in milk and soda bottles (although it made other bottle types), the plant began machine manufacture by 1920, although many of the bottles were still mouth blown. The factory continued in production until 1930. See Lockhart et al (2009) for more details.

Three different Southern Glass Co. logos were embossed on 1915-patent Coca-Cola bottles. One of these, a simple “S” in the center of the base, was embossed on at least four hobble-skirt bottles, with 64-8 (or other numbers following the “64”) embossed on the heels. This mark has not been found on other bottles that can be traced to the Southern Glass Co. The logo may well have been used on Coca-Cola bottles from the beginning of production in 1919 until ca. 1923.

The third logo used by Southern Glass on soda bottles is also found on the bases of at least two 1915 hobble-skirt bottles. This mark consisted of “SGCo” in a downwardly slanted, segmented parallelogram (Figure 18). These bottles have no heel embossing, no date codes, and no city/state designations. Empirical evidence from non-Coke bottles suggests that the mark was used between ca. 1923 and 1926.



Figure 18 – Southern Glass Co. SGCo in a downwardly slanted, segmented parallelogram (courtesy of Mike Miller)



Figure 19 – Southern Glass Co. Star-S logo

Southern used a final logo, the Star-S (also known as the “Southern Star”) from 1926 to 1927 with no date codes (Figure 19). This mark, too, has been found on a 1915-patent bottle with “64-8” embossed on the heel. Although Southern used date codes early on milk bottles, it first began embossing date codes on soda bottles (in conjunction with the Southern Star logo) in 1928.

Illinois-Pacific Glass Corp.

The final West Coast manufacturer’s mark we have discovered on 1915 bottles was the Triangle-IPG mark (Figure 20),



Figure 20 – Example of Illinois-Pacific Glass Corp. Triangle-IPG logo (not a Coke bottle)

used by the Illinois-Pacific Glass Corp. from ca. 1925 until the firm merged with the Pacific Coast Glass Co. in 1930. These had date codes of “7” through “9” (1927–1929), although a few had no date codes and may have been made in 1926. The company used a very few date codes on other soda bottles in 1926 but had adopted date codes regularly on all its soda bottles by the following year. See Lockhart et al. (2005) for more details on Illinois-Pacific.

Conclusions About the First Three “Years”

These discrepancies between the physical (empirical) evidence and the documentary records creates cause for concern. While it is true that the lack of a date code requirement during the critical 1917–1918 period leaves us with somewhat limited information, the data we *do* possess, at the very least, contradicts the written histories. To summarize the empirical data:

1. Hobble-skirt bottle production probably began at some point during 1917.
2. At least two glass houses – Root and Graham – manufactured contour bottles during the first year.
3. Three more glass manufacturers – Chattanooga, Laurens Glass Works, and the American Glass Works – show at least some evidence of having also made hobble-skirt bottles in 1917.
4. *Most* of the hobble-skirt bottles made in 1917 were made by *other* plants – not Root.
5. Four other glass houses (Obear-Nester, Lynchburg, Southern, and Reed) entered into production between 1918 and 1920.
6. Southern Glass Co. was the initial West

Coast hobble-skirt manufacturer, probably beginning in 1919. A shift to Illinois-Pacific apparently occurred during a transition period between 1920 and 1926. 7. The 1915-patent hobble-skirt bottles were made from 1917 to 1930, although only Root continued production during the last two years.

This data suggest that the original information from historical records is inaccurate. It is highly probable that the Root Glass Co. simply did not possess the capacity to fill all the orders for the new hobble-skirt bottles in 1917. We may never know how or why the real selection process began; however, either Root or Coca-Cola (or both in collaboration) almost immediately chose at least three other glass houses to fill orders. As the contour bottle became more popular, Root and/or Coca-Cola added subsequent glass houses to the list.

This evidence fails to support the idea that six manufacturers produced Coke bottles by “the second year” – 1918. The list was probably produced from memory – as was a great deal of the published history of the original 1915-patent bottles. We have found no evidence that the Pacific Coast Glass Co. produced any Coca-Cola bottles; the Pacific Glass Works had closed in 1875 – an obvious mis-identification.

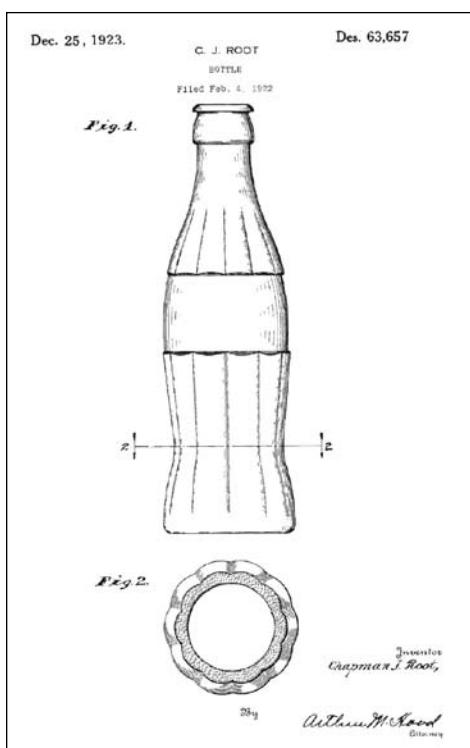


Figure 21 – Patent drawing, December 25, 1923

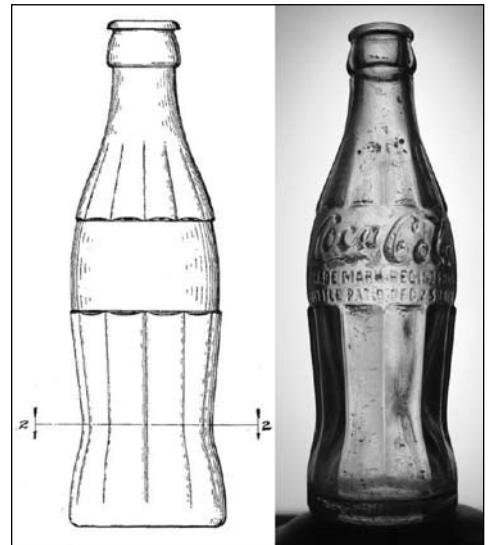


Figure 22 – Comparison of 1923 patent drawing with actual bottle

The Second Patent

On February 4, 1922, Chapman J. Root filed for a patent for a “Design for a Bottle” and received Design Patent No. 63,657 on December 25, 1923. Root did *not* assign the patent to his company. Root specified that he had “invented a new, original, and ornamental Design for a Bottle” and referred to the drawing for details (Figure 21). Again, the term of the patent was 14 years.

This drawing had radically changed from the original patent drawing of 1916. Of importance, the bulge had dramatically decreased, and the constriction or waist was both reduced and moved upward. In addition, the labeling area was now clearly illustrated. In other words, this drawing really *looks* like a Coke bottle (Figure 22).

Dean (2010:148) described the physical changes made to the Christmas bottle so well that the integrity of his wording needs to be preserved:

In the process of patenting the 1923 bottle, Earl R. Dean was called upon to make a design change in the 1916 (modified) bottle. In addition to changing the embossed patent date from November 16, 1915[,] to December 25, 1923, Dean was instructed to make the change so minor that it would not be noticeable to preserve the integrity of the highly successful design. He obviously succeeded. As of this writing, the change is still mostly unknown.

The change consisted of making notches, or breaks, in the two vertical ribs separating the front and back panels of the 1916 bottle. The breaks were made in the ribs adjacent to the tops and the bottoms of the panels, resulting in the panel lines being extended completely around the bottle. This change was carried over to later glass contour bottles and can be seen at a glance if one knows what to look for. [Figure 23]¹⁷



Figure 23 – Comparison of 1916 and 1923 bottles – note indentations on rib at both sides of the labeling area

This brings up interesting issues, and the alterations made to the *bottle* need to be discussed in light of the changes in the patent *drawing*. These are two different issues – although they are distinctly related. In order for the 1923 design patent to be issued, the bottle featured in the drawing had to be sufficiently changed to warrant a new and separate patent. This *should* have been basically simple, since the 1915 patent was for the original Dean prototype that was never actually placed into commercial use.

However, Root seems to have had trouble obtaining the patent. He filed the application on February 4, 1922, and did not receive the patent until December 25 of the following year. That is a delay of one year, ten months, and 21 days! This suggests that the patent office was hard to convince. Root had to show that his design was sufficiently different from the original to warrant a new patent.

This delay in the patent approval does not make intuitive sense, especially in light of the comparative ease with which the next (1937) patent was accepted. Since the 1916 patent was for the original prototype bottle that was never used, the drawing bore little resemblance to actual containers filled by Coca-Cola bottlers. It is thus highly likely that the patent office compared the new drawing to the actual bottle in use – and questioned whether this was a sufficient design change to warrant a new patent. Although probably not recorded anywhere, this *must* have been an interesting story.

As usual, the evidence calls to mind as many questions as it does answers. Who drew the design for the 1923 patent? Dean noted that his father actually *made* the design changes, but who drew the design for the 1923 bottle? The best guess, of course, is Dean. If so, why did that identification not come up in any of the interviews. It seems likely that he would have said something like, “Yes, and they did it to me again in 1923” or words to that effect.

Dean answered another question, probably correctly (at least in our opinions). The original patent was good for 14 years. Root applied for the 1923 patent just seven years, three months, and 19 days after the original patent was received. The patent was only halfway through its term, seemingly nullifying the need for a new patent. According to Dean (2010:31), however, “Root’s interest in developing the Coca-Cola bottle was, at that time, defensive. He wanted to protect the soft-drink bottle business that he

presently had and felt that if a bottle were adopted that he could not manufacture, that the Root Glass Company might suffer.”

Dean (2010:132) later went into even more detail. Even though Coca-Cola advertised that its new bottle was patented and “therefore cannot be used by any other manufacturer of any other kind of bottled carbonated goods,” Root was likely concerned because the original patent drawing had little resemblance to the actual bottle in use. There was no actual patent for the design used for the bottle embossed “BOTTLE PAT’D NOV. 16, 1915.”

However, Root did not assign the patent to his company. This *must* be significant, although the timing is not intuitive. In 1922, when Root applied for the patent, the Root Glass Co. was going strong and showed every indication of remaining one of the dominant soft drink bottle manufacturers. Root had its own automatic machine, and the development of its most important potential rival, the Owens-Illinois Glass Co., was years in the future. However, as noted by Dean (2010:132), if Root ever sold the company, the lucrative patent and attached royalties would go with it. Did Root foresee the downfall of his firm? If so, he was prescient, indeed. The Root Glass Co. remained in business until 1932 – ten years after Root applied for the patent – when Root sold the company to Owens-Illinois. He must have wanted to retain the royalties on bottle sales, even if the company folded.

Table 2 – 1923-Patent Hobble-Skirt Bottle Makers

Manufacturer	Location	Dates*
Southern Glass Co.	Vernon (Los Angeles), California	1928
Illinois-Pacific Glass Corp.	Los Angeles, California	1928-1932
Owens-Illinois Pacific Coast Co.	Los Angeles, California	1934-1938**
Graham Glass Co.	Evansville, Indiana	1928-1929
Owens-Illinois Glass Co.	Evansville, Indiana	1930-1938†
Laurens Glass Works	Laurens, South Carolina	1928-1938††
Chattanooga Bottle & Glass Co.	Chattanooga, Tennessee	1928-1938††
F.E. Reed & Co.	Rochester, New York	1928-1929
Root Glass Co.	Terre Haute, Indiana	1928-1932

* Dates of production of 1923-patent hobble-skirt bottles based on empirical evidence

** Very few 1923-patent bottles were made by Owens-Illinois in California in 1934 (two in our sample).

† Almost all 1930 and 1931 date codes are on molds made for Graham Glass Co.

†† Very few 1923-patent bottles were made by *any* glass house in 1938.

Again, we need to look at empirical evidence – although not in as great a detail as in the case of the first patent. The same researchers who addressed the manufacturing dates for the 1915-patent bottle also addressed the use of the Christmas Coke bottles. Gilborn (1968:15) and Pollard (1993:45) dated the manufacture of the 1923-patent bottles at 1924 to 1937. Kendall (1978:7) claimed a range of 1926 to 1938. The earliest date code we have found on one of these bottles, however, is for 1928, and they were made until 1938. See Table 2 for a list of the nine glass houses that made the 1923-patent bottles.

Once again, there seems to be a gap between the patent date and manufacturing date. Unlike the 1915-patent bottle – where the main hesitation was on the part of bottlers who wanted to use up the existing supply of outmoded bottles – the probable reason for a lag here has to do with the manufacturing process. One of the costliest replacements in bottle production is the molds. We find repeated evidence that manufacturers used molds until they wore out. It is probable that the glass houses simply balked at producing the new design as long as old molds were still functional. Root, a glass maker, would have been very understanding.

According to Ben Napier's information, one final change was connected with the Christmas Coke bottles. At a meeting of the bottle manufacturers on May 29, 1934, the Coca-Cola Co. announced that henceforth the "manufacturer's mark, date of manufacture, and mold number were to be blown in at the 'hobble' on the flute beneath the word 'PAT'D.'" At the same time, the contour of the reinforcing ring on the finish was standardized for the first time.

The Third Patent

Eugene Kelly, of Toronto, Ontario, Canada, filed for a "Design for a Bottle" at the U.S. Patent Office on March 24, 1937. He received Design Patent No. 105,529 on August 3 of the same year and assigned the patent to "The Coca-Cola Company, Wilmington, Del., a Corporation of Delaware." Again, the drawing was the main determinant of the design (Figure 24) and the wording in the text indicated that Kelly "invented a new, original, and ornamental Design for a Bottle."

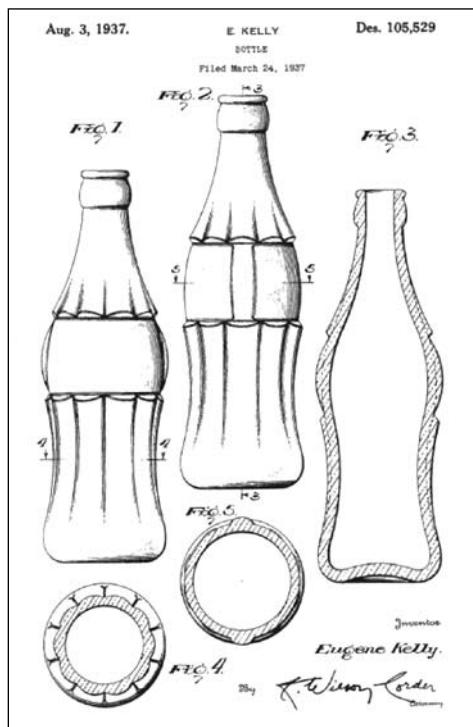


Figure 24 – Patent drawing, D-105523, August 3, 1937

The Patent Act of 1927 created a change in the markings on Coca-Cola bottles (and all other patented items). Prior to the act, the Patent Office required the *date* of the patent to be clearly placed on the patented item. Following the Act, the date was replaced by the patent *number*. Because of this, bottles of the third patent are embossed "BOTTLE PAT. D-105529" – replacing the patent date that was used on the first two bottle styles.

Even though the process for this patent only took four months and ten days to complete, this bottle was still a recognizable variation of the one patented in 1923. The speed with which this patent zipped through the process may also have an interesting story attached to it. However, the explanation may be much simpler. When Root applied for the 1923 patent and faced a long delay before receiving it, the 1915 design was still

under patent protection. That protection required Root to show good justification that his design was, in fact, sufficiently different to warrant a new patent. In this case, the 1923 patent would elapse in just a little over four months. This shorter period may have created less potential for conflict.

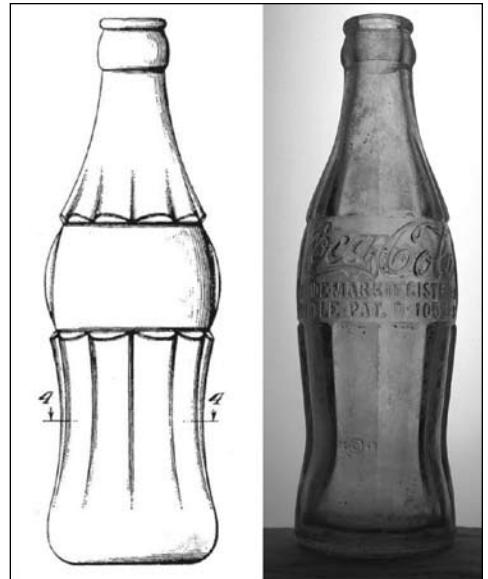


Figure 25 – Comparison of 1937 patent drawing (D-105523) with actual bottle

The 1937 drawing emphasized a thicker waist, with the constriction moved to a higher point, with a notably greater curvature in the labeling area. The heel of the bottle in the drawing is much rounder, and virtually every other feature is exaggerated. This effect, although apparent in the patent drawings, is *not* present upon a visual examination of actual bottles, and it is *not* supported by actual measurement (Figure 25; Table 3). In fact, the bottle embossed "BOTTLE PAT. D-105529" has a slightly *narrower* waist than the earlier, December 25 bottle. It seems obvious that the *drawings* were intended to emphasize differences between the two designs for the purpose of claiming a "new, original, and ornamental design."

Table 3 – Measurements of Selected Hobble-Skirt Bottles (in cm.)

Bottle	Bulge		Constriction		Heel	
	Seam	Center	Seam	Center	Seam	Center
PAT'D NOV. 16, 1915	6.1	5.95	5.1	5.0	6.1	6.1
PAT'D DEC. 25, 1923	5.95	5.9	5.3	5.2	6.1	6.1
PAT. D-105529	6.0	6.0	5.1	5.35	6.1	6.1
IN U.S. PATENT OFFICE	6.0	5.9	5.2	5.2	6.0	6.0
ACL	5.9	5.9	5.15	5.1	5.95	5.9

As noted above, Ben Napier provided Bill Porter with a list of “directives” that Coca-Cola sent to the glass houses, including a letter requiring changes to comply with the 1937 patent. Aside from the obvious alteration of the patent number, changes in the D-105529 bottle included:

The side flutes between the trade-mark panels were made elliptical in shape. The Coca-Cola script trade-mark was modified slightly to give it a more graceful appearance.

The bottom (base) of the bottle was to be flat instead of concave.

Specified diameters were reduced by .010” because of previous dimensions applied to molds rather than finished bottles.

Each of these changes deserves a bit of discussion.

Elliptical Side Flutes

These are the ribs that divide the front and back labeling areas. In a visual comparison of a 1923 bottle, a 1937 (D-105523) bottle, and the 1937 patent drawing, a few interesting features of these side “flutes” become apparent. The patent drawing labeled “Fig. 5” shows a cross-section of the hobble-skirt bottle at the center of the labeling area. The drawing shows the flutes as being very rounded. When the 1923 and 1937 bottles are laid on their sides with a flute on each bottle facing upward, it is obvious that the 1937 flute is more rounded and more pronounced. The difference in thickness is less noticeable when the bottles are held side by side with the finish up – although it is still apparent. This feature is shown much more clearly in “Fig. 1” of the patent drawing. Finally, when the flute is viewed directly (as in “Fig. 2” of the patent drawing), it is also more elliptical than the one on the 1923 bottle.

Coca-Cola Script Logo Modification and the Flat Base

Although very slight, the logo really has noticeable alterations. The finial at the end of the “tail” underlining the “oca” is shorter, wider, and slightly reshaped, and the loop at the top of the “C” is a bit larger. The concavity of the base on the 1923 bottles is very slight, but the 1937 modification really is flat, although it

is recessed below the resting point (i.e., the ring upon which the bottle actually sits on the table). “Fig. 3” in the patent drawing, however, shows the base to be concave. The patent drawing is actually more of a caricature of Coke bottle than a representation of the bottle, itself.

Dean (2010:145) stated that his father “made changes to the 1923 bottle ‘a hundredth of an inch here and there.’” While this old memory seems to support the requirements noted by Napier, neither conforms to the obviously larger changes shown in the patent drawings (see Figure 25), and such minute changes in the bottle, itself, would certainly *not* qualify it as a “new, original, and ornamental design.”

It is notable that the Coca-Cola company now had control over the design patent for its own bottles for the first time – after 21 years, eight months, and 18 days of control by Chapman J. Root and/or the Root Glass Co. But, like all the other patents, the evidence we find leaves unanswered questions.

The first question wraps around a topic we broached earlier. Where does the Owens-Illinois Glass Co. fit into this picture? Owens-Illinois bought the Root Glass Co. in 1932, five years prior to the elapse of the Root 1923 patent. It is probable that the patent, in the name of Chapman Root, did *not* transfer to Owens-Illinois – although a significant portion of hobble-skirt bottle manufacture *did* go to the firm. By 1932, Owens-Illinois controlled both the former Root Glass Co. and the former Graham Glass Co.⁸ The plants continued to make Coke bottles (including transition bottles embossed with logos of both Owens-Illinois and the former firms).

Did Chapman Root refuse to sell/transfer the patent to Owens-Illinois? Did he continue collecting royalties on Coke bottles for another seven years? Did Owens-Illinois attempt to obtain a patent on the Coke bottles? Did the giant glass firm even care? Did Coca-Cola and Owens-Illinois reach some tacit agreement? We will almost certainly never know or even rationally speculate about the answers to most of these questions.

Another question is: Why was Kelly chosen as designer? According to Dean (2010:134), “Why Kelly was chosen to be inventor was anyone’s guess.” Dean noted that his father had “obtained Root’s approval every step of the way . . . when

he made the minor changes in the bottle for the 1923 and 1937 patents.” In this case, Dean may have overstepped his bounds in his defense of his father.

Since Chapman Root sold the glass business to Owens-Illinois in 1932, he had been out of the picture for five years when the 1937 patent occurred, and Earl Dean now worked for Owens-Illinois. There is no evidence of any sort that Owens-Illinois was even remotely involved in the 1937 patent. This was a coup that was apparently carefully engineered by the Coca-Cola Co. to gain control – for the first time – of what was possibly the firm’s greatest asset.⁹

According to Dean (2010:134), Eugene Kelly, a Georgia native, operated the Canadian Coca-Cola operation. Eventually, Kelly rose to be a national director before retiring on November 5, 1969. As Dean noted, Kelly is very unlikely to have actually designed the slight changes in the bottle. However, it is highly probable that he assigned that duty to one of his Canadian plant employees – then took the design to the U.S. patent office. It would be interesting to know if Kelly planned the coup alone and delivered it as a surprise to the main office. To have presented such an accomplishment to the Board of Directors would certainly have been a feather in his cap.

Ben Napier (noted above) may have provided at least a partial answer to this enigma. In a letter to Bill Porter, Napier stated that “during 1936, the bottle manufacturers were asked to submit proposed minor design changes for the purpose of obtaining a new patent.” This second contest, then, was apparently won by Kelly. While there seems to have been no specific prize involved, the resulting patent certainly had an effect on Kelly’s mobility within the company.

The typical lag between patent and manufacture seems to have disappeared with this bottle change. Gilborn (1968:15) and Pollard (1993:45) both claim no lag at all; the bottles were made from 1937 to 1951. Kendall (1978:7) agreed with the 1951 closing date but set the first manufacture of the new style at 1938. Our study agrees with Kendall; the bottles were made between 1938 and 1951. By this time, only four glass houses still manufactured Coke bottles: Owens-Illinois Glass Co., Chattanooga Glass Co., Laurens Glass Works, and Liberty

Glass Co., Sapulpa, Oklahoma. The first three made the bottles during the entire hobble-skirt period, but Liberty Glass was a latecomer to Coca-Cola bottle production, only making the D-patent bottles in 1950 and 1951 – mostly for bottlers in Oklahoma and the surrounding states. See Table 4 for a chronology of Coke bottle changes.

IN U.S. PATENT OFFICE

On August 3, 1951, the D-105529 patent expired, 14 years after it was issued, and the new Coca-Cola bottles were embossed “TRADE MARK REGISTERED / IN U.S. PATENT OFFICE.” The top line was identical to the ones on each of the previous bottles, but the second line was a complete change. In reality, the embossing *only* means that the script Coca-Cola logo was registered as a trademark in the patent office.¹⁰ The patent protection on the bottle, itself, had elapsed in August. The embossing of “IN U.S. PATENT OFFICE” on the bottles was probably an attempt to discourage any copies of the bottles (Figure 26). After all, it still looks impressive – even though it has no meaning as far as the bottle, itself, is concerned.



Figure 26 – IN U.S. PATENT OFFICE bottle

retrospect – not from the viewpoint of the Coca-Cola Co. during the actual period between 1951 and 1960. Kurtz was fully

Citing Coca-Cola archivist, Wilbur Kurtz, Jr., however, Dean (2010:133-134) claimed that the bottle was protected by “common law rights” during this period, an idea also supported earlier by Munsey (1972:58). This is a reference to the common law rights for trademarks. According to the U.S. Patent and Trademark Office (2010):

Federal registration is not required to establish rights in a trademark. Common law rights arise from actual use of a mark. Generally, the first to either use a mark in commerce or file an intent to use application with the Patent and Trademark Office has the ultimate right to use and registration.

Johnson & Denklau (2003) make the distinction more clear: “Unlike trademark common law rights, patent protection must be granted by the Patent and Trademark Office.” In other words, common law protection *only* applies to trademarks.

It is important to realize, however, that Kurtz was looking at the issue in retrospect – not from the viewpoint of the Coca-Cola Co. during the actual period between 1951 and 1960. Kurtz was fully

aware of the 1960 trademark of the *bottle* – an action that was unknown in 1951 (see the next section for a discussion of the trademark itself). It was thus easy for Kurtz to recognize the application of the common law when applied to a trademark long *after* the trademark had been established. It was quite a different situation during the 1950s.

The term “common law” indicates that there is NO written statute that applies. U.S. courts, however, have supported the idea that the first person to use a name and/or symbol had the “right” to the exclusive use of that name and/or symbol in the future. However, each court case becomes a new challenge to the “common” idea. Sometimes, a new challenge completely reverses the older “common” interpretation. Therefore, the application of common law is much more tenuous than Kurtz, Musney, or Dean make it sound.

One major issue that almost certainly made the Coca-Cola Co. uncomfortable is that the common law application presupposes that a logo will *meet the qualifications for a trademark*. That assumption was, at, best unclear at the time and under the circumstances. Only a single bottle had previously been granted trademark status – the Haig & Haig “pinch” bottle. Thus, there was little precedent for the idea that a bottle can be used as a trademark.

A second possible issue was addressed by Pendergrast (1993:185). If a name falls into common usage, a company can lose its trademark rights. The terms aspirin, cellophane, and escalator had already suffered those fates, and Coca-Cola worried by at least the 1930s that the same could happen to its product. In fact, the company *did* lose the right to the word “cola” in a 1945 case against Pepsi.

Unfortunately, we have found no records from the 1951-1959 period. Past researchers have merely noted the period and moved on or ignored it completely. This *must* have been a time of great tribulation for the Coca-Cola Board of Directors and legal staff. A tremendous brand loyalty hinged on the exclusive use of the hobble-skirt bottle by Coca-Cola. The company must have explored pathways to protect the bottle.

Since methods of legal protection for packaging in the U.S. are limited in number, Coke almost certainly attempted

Table 4 – Dates of Manufacture of Hobble-Skirt Bottle Characteristics

Characteristic	Dates
PAT'D NOV. 16, 1915	1917-1930
Manufacturer's mark and date code on heel	1919 (1917) -1934
PAT'D DEC. 25, 1923	1928-1938
Manufacturer's mark moved from heel to skirt	1932?-1951
Two numbers to right of logo – date code	1932?-1951
PAT. D-105523	1938-1951
IN U.S. PATENT OFFICE	1951-1967 (embossed bottles)
MIN. CONTENTS 6 FL. OZS.	1917-1958
CONTENTS 6 ½ FL. OZS	1957-end of 6½ oz.
Manufacturer's mark moved to base	1952-present
Two numbers to left of dash – date code	1952-present
Line spacers on base embossing	1952-present
Applied Color Lettering	1955-present
BOTTLE TRADE MARK ® (base)	1962 (1964 on 6½ oz.)-?

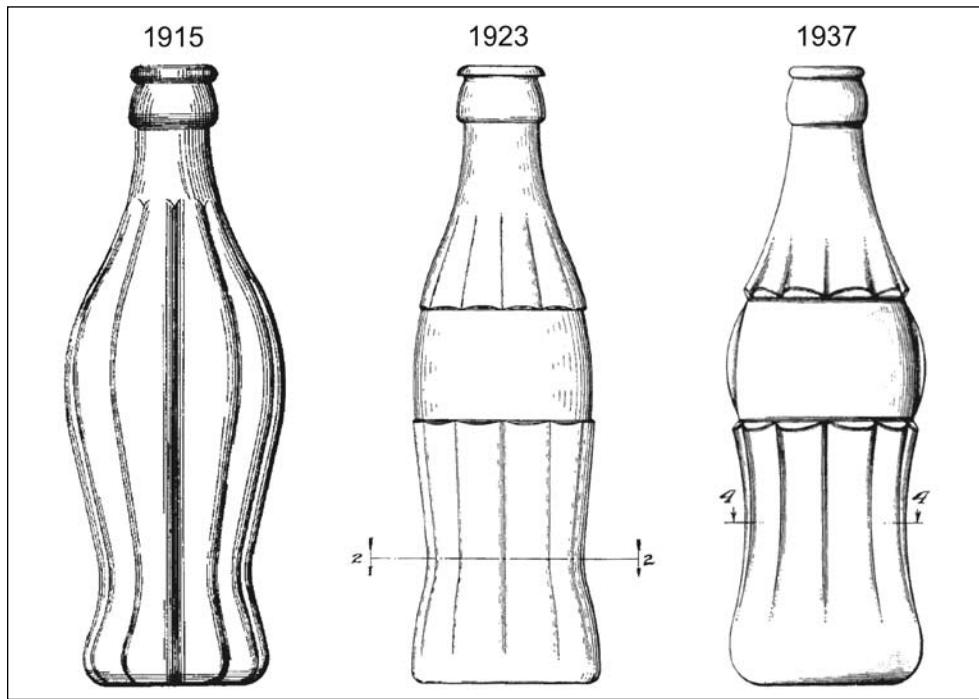


Figure 27 – Comparison of all three patent drawings (1916, 1923, 1937)sides of the labeling area

to capture another patent. However, it is already pretty amazing that the Patent Office issued a total of three patents for what is essentially the same bottle design. As is obvious from the patent drawings, those were all for the same bottle. In fact, it is remarkable that no one challenged the first or third patent (Figure 27). Only the 1923 patent drawing actually fits the specifications for the bottle that was in use!

It is likely that the Coca-Cola representatives attempted to establish a new patent either prior to the expiration of the 1937 patent or immediately thereafter. If so, the patent office balked. Minor design changes resulting in a patent can apparently be pushed only so far – and the 1937 patent was the end. It is highly likely that dead-end patent applications were not permanently recorded at the patent office, so information along this line of research will probably remain obscure. How long the patent route was followed (if, indeed, the Coca-Cola legal staff pursued that venue) is currently unknown, but the bottle remained vulnerable for almost eight years and seven months.

The Trademark

On March 19, 1959, on behalf of the Coca-Cola Company, Pamela C. Mallari, an attorney for the firm, filed to register the contour Coca-Cola bottle as a Trademark. The company received

Registration No. 0696147 on April 12, 1960. According to the registration, “The Trademark consists of the distinctively shaped contour, or confirmation, and design of the bottle as shown.” The firm claimed an initial use on July, 8, 1916, and a first use in commerce on September 1, 1916. The Trademark was renewed for the third time on March 24, 2010.

We have not discovered whether Coca-Cola gave up on a new patent or decided to stop playing a temporary game in favor of a more permanent protection. The timing, however, strongly suggests that the trademark solution was *not* conceived for most of the unprotected period (1952-1960). Since first use of the bottle as a trademark was registered as September 1, 1916 (almost certainly the date of the initial ad), Coca-Cola could legally have trademarked the bottle in 1952. The application date of March 19, 1959, strongly suggests that Coke came up with the trademark idea no earlier than 1958. To have remained legally unprotected while aware of an alternative is simply incongruent with Coca-Cola policies and history. What is certain, however, is that the shape of the bottle was now, finally, legally protected on a long-term basis. Equally certain, the Coca-Cola Co. carefully monitors the trademark; it has now been renewed three times.

The only physical change that is specific to the trademark was the addition of “BOTTLE TRADE MARK ®” in a circle around the manufacturer’s mark – embossed in the center the base (Figure 28). This “bottle” trademark was first applied to embossed 6½-ounce bottles in 1964 and to ACL 6½-ounce bottles in 1965. The term “IN U.S. PATENT OFFICE” continued to be embossed in the labeling area. Other changes (described below) were unrelated to the actual trademark process.



Figure 28 – Base marking for bottle trademark

It is probably not a coincidence that 1965 was also the year that Coca-Cola instituted the use of the “random baseplate.” Beginning that year, the city and state designations were placed randomly on hobble-skirt bases. Prior to that time, each franchise ordered bottles embossed with its own city/state designation. These were originally bottled *only* by that franchise and in that city, although each bottler filled bottles that came from any other location once they were returned by customers. The random base names, however, meant that each bottle could have been originally filled literally anywhere in the U.S. The city/state designation had become meaningless.

Although Gilborn (1958:15) placed the IN U.S. PATENT OFFICE bottles in production from 1951 to 1959, and Pollard (1993:45) dated them from 1951 to 1963, the bottles actually continued to be manufactured until 1965.¹¹ From 1951 to 1958, the bottles were embossed “MIN. CONTENTS 6 FL. OZS.” on one side. That changed in 1957 to “CONTENTS 6½ FL. OZS.” and remained in that format, even after Applied Color Lettering (ACL) began to be used in 1955 (Figure 29). Note that both volume designations were used in 1957 and 1958. There was also

an overlap from 1955 to 1965, when both embossed and ACL labels were in use (McCoy 2009:40-56).

A few other details of these changes are worth noting. The use of ACL in 1955 was only on the larger sizes. ACL was not applied to the 6½-ounce bottle until 1957 – two years later. This lag may indicate a resistance to *any* type of change in the “sacred” 6½-ounce bottle. In 1959, “Coke” was applied in white ACL to the necks of bottles. The “Coke” designation was moved to the reverse side of the labeling area (with “Coca-Cola” remaining on the front) in 1963. Coca-Cola had registered “Coke” as a trademark in 1945 but did not immediately use it on bottles.

Conclusion

The story of the bottle, at least in this case, is equally as interesting as the story of the product – possibly more so. The Coca-Cola contour bottle (or hobble-skirt, or Mae West) went through a series of changes, including three patents, one trademark, and a period of dubious protection under common law. These changes have been repeatedly chronicled in the past, but almost every researcher has repeated the same (or a very similar) story.

Our analysis, using a different interpretation of existing documentary and secondary evidence, combined with empirical observations of bottles and recent discoveries in glass manufacturing histories, points out major discrepancies in the existing secondary publications. With every patent, we have found inconsistencies and raised new questions. Some of these, we were able to answer. We have summarized our findings below, divided according to changes in the bottles.

The original 1915 patent:

1. Hobble-skirt bottles were initially manufactured sometime between April and August of 1917.
2. The Graham Glass Co., Chattanooga Bottle & Glass Co., Laurens Glass Works, and the American Glass Works



Figure 29 – Example of ACL bottle

apparently made more of the “first year” bottles than the Root Glass Co.

3. Empirical data do not support the claim that there were six additional manufacturers added to the Root Glass Co. in the “second year.” Some of those six made hobble-skirt bottles in 1917, and two glass houses, not included in the “second year” list may have made bottles by 1918.

4. Southern Glass Co. was the initial West Coast hobble-skirt manufacturer, probably beginning in 1919. A shift to the Illinois-Pacific Glass Corp. apparently occurred during 1926.

5. The 1915-patent hobble-skirt bottles were made from 1917 to 1930, although only Root continued production during the last two years.

6. The actual bottle produced was *very* different from the patent drawings.

7. Evidence produced by Dean (2010) shows unquestionably that Earl Dean was the designer of the bottle, despite the patent being in the name of Alexander Samuelson.

The 1923 patent:

1. This is the only patent where the drawing actually matches the bottle that was produced.
2. It is almost certain that Earl Dean also authored the changes to this patent, even though the patent was issued to Chapman J. Root.
3. From the date the patent request was filed, it took almost two years for the patent to actually be issued!
4. Cuts at the top and bottom of the ribs dividing the front and back labeling areas comprise the most notable change from the 1915-patent bottle.
5. According to our sample, 1923-patent bottles were only made from 1928 to 1938.

The D-105523 patent:

1. The patent drawing of this bottle is out of proportion almost to the point of being a caricature of the bottle. This was probably done to convince the patent agency that there was sufficient change

to warrant issuing a new patent.

2. Despite the drawing, a patent was issued in a short time (unlike the 1923 patent).

3. Eugene Kelly, Toronto, Canada, received the patent and assigned it to the Coca-Cola Co. Coke now had full control of the bottle for the first time.

4. Earl Dean again claimed that he made the changes (and correctly described *some* of them), although he now worked for Owens-Illinois. We have not found a connection between Owens-Illinois and Coca-Cola (except for the actual production of bottles), especially the Toronto branch of Coke.

5. Four small changes were made to the bottle: minute changes in size; small changes in the shape of the Coca-Cola script logo; elliptical shape for ribs in labeling area; and flat base.

6. Bottles were made between 1938 and 1951.

IN U.S. PATENT OFFICE

1. In 1951, when the D-105523 patent expired, the bottles were embossed “IN U.S. PATENT OFFICE” where the patent information used to be.
2. The new embossing referred to the script trademark *not* to the bottle, itself.
3. The bottle remained essentially unprotected for almost eight and one-half years (1951-1960).
4. The “common law” protection cited by previous researchers was tenuous at best.

The bottle as trademark

1. The bottle, itself, officially became a trademark on April 12, 1960, offering permanent protection from use by other companies.
2. Trademarks must be periodically renewed, and Coke has renewed this trademark twice since it was issued.
3. The only physical change to the bottle was addition of “BOTTLE TRADE MARK ® in a circle around the manufacturer’s mark – embossed in the center the base.

The actual history and physical evidence tell a great story of the process of this remarkable bottle.

Postscript – Historical Research

Historical research is like putting together a jigsaw puzzle with most of

the pieces missing. The process is *never* finished, and *no one* ever has the last word. The first person who publishes about any historical subject is certain to be corrected later. In this process, we all climb onto the shoulders of those who came before us. Presenting new information or different ways of looking at a subject is not intended as an insult to those who came before. In our turn, future information will supercede this work. And so the process continues

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[1] There is no question that the bottle was machine made rather than mouth blown. Earl Dean described the process (see Dean 2010:27-28, 46, 97), and the two actual extant bottles have clear indications of machine manufacture, such as side seams

that extend to the top of the finish.

[2] Although they did not follow all of the nuances of Dean's version of the invention, Munsey (1972:57) and Hopson (2002:4; 2004:6) both agreed that Dean – not Samuelson – was the inventor of the bottle.

[3] It is possible that Chapman Root refused to let Owens-Illinois make Coke bottles after the sale in 1932. This, however, is unlikely. Beginning in 1930, Owens-Illinois began making hobble-skirt bottles at the former Graham plant at Evansville – using molds that still had the Graham codes on the heels. Owens-Illinois probably made a sufficient number of Coke bottles at the former Graham plant (and others) but shifted production at Terre Haute to other bottle types.

[4] The Loogootee plant made occasional hobble-skirt bottles after 1921, but these probably represent overruns – orders that the other plants could not handle.

[5] One of the interesting side discoveries is that the "2 ©" mark on Coke bottle bases almost certainly indicates the Corsicana, Texas, plant.

[6] The use of the triangle mark may have begun near the end of 1923. We have only found one example with a 1923 date code, yet there are multiple bottles from other years.

[7] In his letter to Bill Porter, Ben Napier confirmed that "the flutes separating the trademark panels were modified by cutting them in at top and bottom" on the 1923 bottle.

[8] The Owens Bottle Co. bought the Graham Glass Co. in 1916 – possibly as an entrance into the lucrative Coca-Cola bottle production. The firm continued to operate under the Graham name until the merger that created Owens-Illinois in 1929.

[9] Dean (2010:13-22) spends considerable time making a case that the contour bottle was very important in Coca-Cola popularity. Even though blind taste tests proved otherwise, some drinkers claimed that the product tasted different in containers of any other shape.

[10] John S. Pemberton received the initial trademark for the script Coca-Cola logo on June 28, 1887. With the passing of the new Trademark Law of 1905, the script logo continued to receive protection (Pendergrast 1993:35, 104).

[11] McCoy (2009:38-41) places the date at 1967, and some collectors have reported dates for IN U.S. PATENT OFFICE bottles of 1966, 1968, and even one with a date code for 1975! These, however, are almost certainly errors in date codes or occasional exceptions produced by some factories.