

The Glass Works of the Rylands Family and Hiram Codd

Bill Lockhart, Beau Schriever, Bill Lindsey, and Carol Serr

Although Ben Rylands was a successful bottle maker prior to his association with Hiram Codd in 1873, the two became partners in 1877, remaining together until Rylands' death in 1881, pairing Rylands' manufacturing skills with Codd's inventive genius in his series of patents using a marble as an internal stopper for soda bottles. Rylands' son, Dan, replaced his father, but the pairing was not a comfortable one, and they separated in 1884. After Codd's death in 1887, Rylands continued the production of Codd-stoppered bottles. Although Dan Rylands committed suicide in 1910, his final firm continued production of Codd-stoppered bottles (and other containers) until 1926.

The Hiram Codd and Dan Ryland Patents

Hiram Codd first patented his ball-stopper idea in England on November 24, 1870, and followed up with British patents in 1871 and 1872 and U.S. patents in 1872 and 1873. The bottles were most popular in England and other members of the British Commonwealth, especially Canada, Australia, and India, although some were used in the U.S. (Figure 1). This style, however, was never a popular one outside the English sphere of influence (Lindsey 2018; von Mechow 2018).

Codd's system used a ball made from glass, gutta percha, or other material inside the bottle that sealed against a grommet fitted into a groove inside the finish at the top of the neck. The pressure of the carbonation in the liquid held the ball in place. Various grooves and stops inside the bottle prevented the ball from either falling into the bottom of the bottle or re-plugging the opening at the top when the drink was poured. To open the bottle, a special device (or anything else that would fit into the opening) pressed the ball downward, breaking the seal and releasing some of the pressure with a popping sound.



Figure 1 – Codd bottle
(von Mechow 2018)

One mystery about the Codd patents is in the sequencing of numbers and dates. Codd received English Patent No. 3,070 on November 24, 1870. Although his second British patent was not issued until August 22, 1871, it received No. 2,212 – a lower number than the initial patent. This makes no intuitive sense, but Codd referred to the earlier patent – *by number* – in his second patent. The dated sequence, therefore, must be correct (see von Mechow 2018).

In the 1870 patent, Codd noted that “the invention relates to the construction of bottle necks with transverse passages for stoppering them. At the top of the bottle is a head piece having a transverse hole through it at right angles to, but communicating with, the hole in the neck.” The stoppers consisted of “balls glass, wood, cork, india-rubber or gutta-percha.” The bottle was to be made with

an annular groove in the inside of the upper end of the neck, and closely fitting therein is placed a ring of cork, india-rubber or gutta-percha, of such thickness that about half the ring will project beyond the mouth of the groove and prevent the ball within the bottle from passing through it. To empty the bottle . . . the ball is pressed down by a lever or other mechanical means.

The 1871 patent concentrated on a method for creating the “contraction in the neck” that is “formed by pressing in the sides so that the neck at that part assumes an oval form. Above the contraction the neck is widened to form a recess into which the stopper rolls when the liquid is being poured out.” On July 23, 1872, Codd received U.S. Patent No. 129,652 for an “Improvement in Bottles” and assigned half the rights to Richard Barrett of London (his business partner – see below). Essentially, this was a combination of the two earlier English patents (Figure 2).

The description in the 1872 U.S. patent was much more complex. It explained how the ball – made larger than the opening of the bottle neck – was placed into the container. First, the bottle was blown into a mold:

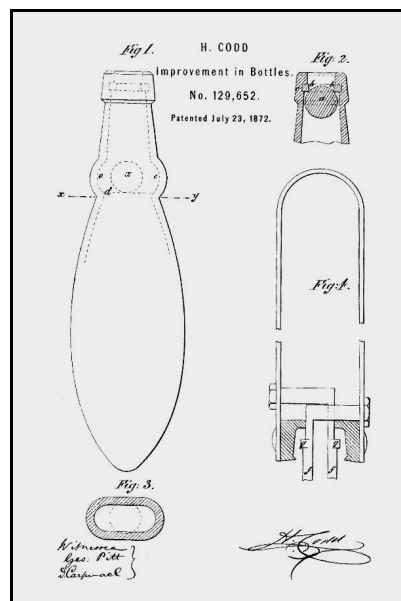


Figure 2 – Codd 1872 patent

When the bottle has been removed from the mold a glass marble previously heated is dropped into the bottle through the neck; the ring or head is then formed at the top of the neck in the ordinary manner by means of the tool above described. After the bottle has been allowed to cool a ring of . . . elastic material . . . is inserted into the groove formed around the interior of the head.

On September 3, 1872, Codd received English Patent No. 2,621 for another improvement to keep the ball from rolling into the mouth of the bottle, when the liquid was poured out. This consisted of “ridges . . . which prevent [the ball] from returning when the bottle is inclined.” The molds were “formed with projections to produce the ridges in the neck when the bottle is blown. Codd applied for a U.S. patent for the same invention on January 21, 1873, and received Patent No. 138,230 on April 29, 1873 (Figure 3). Again, he assigned half the rights to Richard Barrett. Codd changed the word “ridges” to “contractions” in the American patent and once again provided a more in-depth explanation.

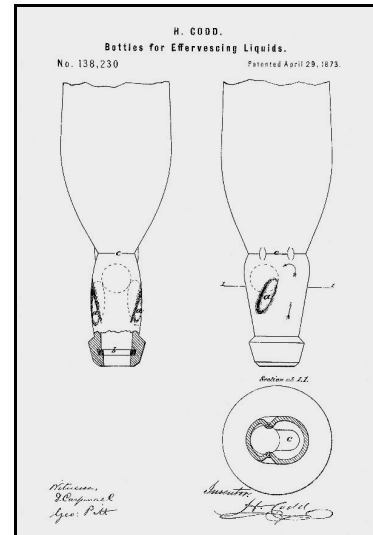


Figure 3 – Codd 1873 patent

Codd apparently had trouble marketing his invention in England. Ross (1982:157) noted that “Alexander & Austin . . . was said to be one of the first firms to whom Hiram Codd licensed the manufacture of his patented mineral water bottle.” This is repeated in some form in publications (e.g., Dunn & Dunn 1987:7; Munsey 2010:5)¹ and on the internet by more than a dozen sites. In our study of the glass houses operated by Alfred Alexander, we find no historical support for any involvement of Alexander & Austin with the Codd-stoppered bottles – with the single exception of Ross, who cited what may have been a vague memory. Since the partnership of Alexander & Austin ended in 1873, the firm would have been a very temporary help to Codd.

¹ Dunn & Dunn (1987:5-8) reprinted a section that he cited as: “Extract from the ‘Mineral: Diary and Text Book, 1882’” on the life of Hiram Codd and his experience in bottle design and manufacture. Coming from an 1882 source, this is the most credible connection between Codd and Alexander & Austin.

Munsey (2010:5) added that “W. Brooke of Hunslet showed interest in [Codd’s] invention” – also in 1872. Codd apparently met Richard Barrett about that time (assigning his initial patent to Barrett), and the two apparently became partners, although we have not discovered any production of the Codd bottles by the pair. In 1877, Codd teamed up with Ben Rylands, and the two began making Codd’s bottles at Rylands’ Hope Glass Works (see the history section below for more on firms and factories). Barrett seems to have become disassociated with Codd by this time, while Dan Rylands became Codd’s partner upon his father’s death in 1881. Codd and Rylands applied for a U.S. patent for a “Bottle Containing Aerated Liquids” and received Patent No. 270,392 on January 9, 1883, for what was essentially a valve in the side of the neck of a marble-stoppered bottle that would release the pressure to allow the ball to be easily pressed into the bottle by finger pressure (Figure 4).

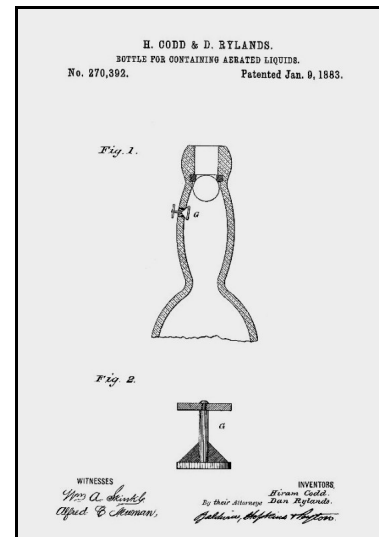


Figure 4 – Codd & Rylands 1883 patent

Codd and Rylands dissolved their partnership in 1884, possibly because of the death of Codd’s wife, Jane, on February 28. Codd seems to have been increasingly less involved in selling and making bottles from that point until his death on February 18, 1887. Rylands, however, seems to have taken up the advancement of the Codd invention (Dunn & Dunn 1987:8,17). Rylands began his own series of patents by 1886:

- 1885 – Patent No. 320,505 – Ben Rylands “Rylands’s Reliance Closure”
- February 8, 1886 – English Patent No. 1,811 – Ben Rylands “Rylands’s Acme Closure”
- unknown patent, probably English – Ben Rylands “Rylands’s Safe Groove Closure”
- July 8, 1881 – English Patent No. 3,252 – Ben Rylands “Rylands’s Valve Closure”
- October 25, 1882 – English Patent No. 2,118 – Ben Rylands “Rylands’s Valve Closure”
- 1882 – English Patent No. 3,525 – Ben Rylands “Rylands’s Valve Closure”
- January 9, 1883 – U.S. Patent No. 270,392 – Ben Rylands “Rylands’s Valve Closure”
- November 19, 1883 – English Patent No. 5,445 – Ben Rylands “Rylands’s Valve Closure”
- November 20, 1884 – English Patent No. 15,281 – Ben Rylands “Rylands’s Valve Closure”
- January, 1885 – English Patent No. 348 – Ben Rylands “Rylands’s Valve Closure”
- unknown patent, probably English – Ben Rylands “Rylands’s Premier Closure”

October 16, 1885 – English Patent No. 12,337 – “Rylands’s Bulb Closure”
January 14, 1887 – English Patent No. 649 – Ben Rylands “Rylands’s Valve Closure”
January 20, 1887 – English Patent No. 876 – Ben Rylands “Rylands’s Valve Closure”
May 24, 1887 – U.S. Patent No. 363,768 – Ben Rylands “Rylands’s Valve Closure”
July 12, 1887 – English Patent No. 9,771 – Ben Rylands “Rylands’s Valve Closure”
January 24, 1888 – U.S. Patent No. 376,916 – Ben Rylands “Rylands’s Valve Closure”

Of course, others took out patents for various “improvements” on the marble-stopper idea, mostly during the 1880s. For more information, see Tod von Mechow’s website (2018). It provides the most complete coverage of Codd bottle patents we have found. As the above patents from von Mechow (2018) show, the early British system began the sequence anew each year.

Initially, Codd licensed the bottle rights to various soda bottlers, but, eventually, anyone could make or use the bottles as the patents expired. Some researchers have credited the Codd stopper as being responsible for the term “pop” being used for carbonated drinks – citing the sound made with the marble was pushed into the bottle. However, Munsey (2010:9) cited poet Robert Southey as using the term “pop” for a bottled soft drink in 1812, noting the sound when the *cork* was withdrawn. This clearly pre-dates the Codd inventions.

Rylands also introduced the “anti-theft” bottle by 1889. These were Codd-stoppered containers with applied finishes of different colored glass than the aqua bottle. Munsey noted that the finishes could be blue, amber, green or red. Although typically made from aqua glass, other Codd bottles were occasionally produced in amber, green, purple, and blue hues (Munsey 2010:13-17).

Eventually, of course, the Codd declined in popularity, replaced by William Painter’s crown cap. The simplicity, low cost, and ease of application (and removal) of the crown made all other forms of closures obsolete. It took several years after Painter’s initial patent in 1892 for the new invention to gain widespread use, but it completely dominated the soft-drink and brewing industries by 1914. However, pockets of popularity – although few and small – remained throughout the 20th century.

Histories

Toulouse (1971:448, 478) only mentioned Codd peripherally; his discussion of Rylands was *very* partial and confused. Since his few findings are mostly inconsistent with later research, we will only follow his illustration of the Rylands logo in the Containers and Marks section.

Hope Glass Works, Barnsley, Yorkshire (1867-1877)

Ben Rylands opened the Hope Glass Works on Stanley Rd., beside a canal, at Barnsley, Yorkshire, England, in 1867. The factory became quite successful. Rylands met Hiram Codd in 1873, and the pair began experimenting with Codd's stoppers. The following year, Codd granted a license to Rylands to manufacture the bottles on the condition that Rylands would buy the marbles and seals from Codd. Rylands admitted Hiram Codd as a partner in 1877, relinquishing 20% of the business to Codd and renaming the operation as Rylands & Codd (Starfoot Station 2018; Wyman & Sons 1888:131).

Rylands & Codd, Barnsley, Yorkshire (1877-1881)

Ben Rylands and Hiram Codd formed a partnership in 1877 to deal with the patents owned by Codd. Since Rylands owned the Hope Glass Works, it was good pairing. The demand for the Codd-stoppered bottles was so great that the partners built a new factory between Grange Lane and Oaks Lane, close to the canal, roads, and the railroad. Both factories continued to operate under the Hope Glass Works name. When Ben Rylands died in 1881, his son, Dan, inherited the Ryland share, and the partnership reorganized as Codd & Rylands in 1881 (Starfoot Station 2018; von Mechow 2018; Wyman & Sons 1888:131).

This partnership creates an unexplained mystery. In the patents section (above), we discovered that Codd assigned a half-interest in both his 1872 and 1873 patents to Richard Barrett – apparently a partner or financial backer. Although we have no direct evidence, we can speculate that Codd and Barrett were unable to find a manufacturer for Codd's stopper during the years between the receipt of the patents (1873) and 1877. It seems reasonable to assume that Ben Rylands purchased Barrett's half of the patent rights. This makes a good hypothesis, although we have no current way to test it.

Codd & Rylands, Barnsley, Yorkshire (1881-1884)

Upon the death of Ben Rylands in 1881, his son, Dan, entered the business in his place, and the firm reorganized as Codd & Rylands – although the relationship was difficult from the start. The pair registered the Crystal Valve patent in 1882, but, when Rylands patented an improvement on the valve, Codd – considering himself the inventor of the enterprise – resented the interference. The partnership disbanded in 1884, when Dan Rylands purchased Codd’s share of the business and became the sole owner (Starfoot Station 2018; von Mechow 2018; Wyman & Sons 1888:131).

Dan Rylands, Barnsley, Yorkshire (1884-1897)

With the separation between Rylands and Codd in 1884, Dan Rylands continued in business under his own name, becoming Dan Rylands, Ltd., four years later in 1888. The differences between Codd and Rylands continued, erupting into a court battle over Ryland’s use of a grooving tool that Codd had invented in 1872-1873 – a case that Codd won (Figure 5). Rylands, however, invented his own groove tool and continued to use the process. Codd died in February 1887, finally bringing the conflict to a halt.

During this period, Rylands gained control of more than 90 patents, adding a Siemens

continuous tank and numerous other improvements to the works. One highly successful patent was for a storage jar “for salmon, meat and fruit.” In 1897, however, the firm again reorganized as the Rylands Glass and Engineering Co., Ltd. (Starfoot Station 2018; von Mechow 2018).

Ryland’s finances took a downturn in the early 1890s. Beginning with fire in the box factory of the Hope works, followed by a strike of the glass workers, Rylands fortune seemed to be dimming. This was exacerbated by bad investments in other businesses, and Dan Rylands

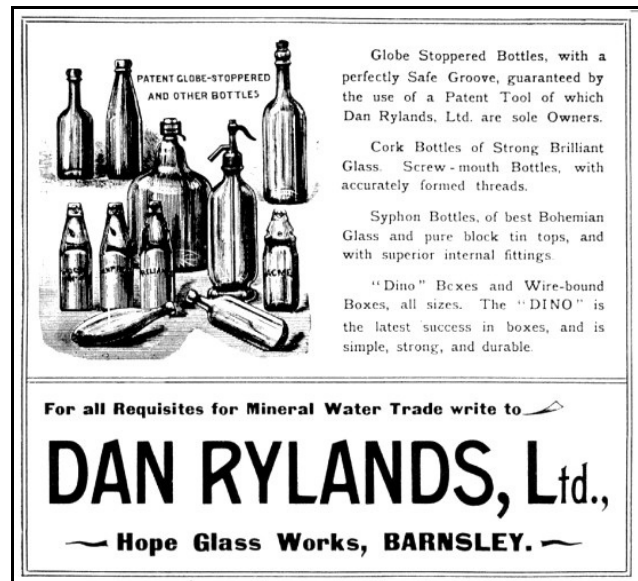


Figure 5 – Undated ad (eBay)

was declared bankrupt in 1893, leading to a suicide attempt. His workers collected money so the family could keep the house, but Ryland had mental difficulties for the rest of his life, finally taking his own life on April 5, 1910 (Starfoot Station 2018).

Rylands Glass and Engineering Co., Ltd., Barnsley, Yorkshire (1897-1928)

The firm reorganized as the Rylands Glass and Engineering Co., Ltd., in 1897. This was a public corporation with Dan Rylands as chairman of the board and manager. The company expanded during the 1920s recession – an error that led to heavy debts from which the firm never recovered. The end came in 1926, although it was 1929 before Beatson Clark of Rotherham occupied the stripped buildings. By that time, the heyday of the Codd-stoppered bottle was over. Soda bottlers adopted simpler closures, especially the crown (Starfoot Station 2018).

Hiram Codd & Co., New York City (1880-1890)

Hiram Codd opened an American agency to sell his bottles at 22 Park Row, New York City in 1880. According to Codd, the bottles were made at the “Patentee’s own works at Barnsley.” Around 1886, the City of New York renamed the street, so Codd’s new address became 22 Commerce St. Hiram Codd, Daniel Rylands, and Thomas Rylands were all listed with the firm during that year. Also, in 1886, the Whitney Brother, Glassboro, New Jersey, began production of his bottles. Dan Rylands posted a notice in the November 16, 1888, *New York Evening Post* that he had retired from Codd & Co. on October 22 of that year. The firm dissolved ca. 1890, the year that Codd’s 1873 patent expired – although Codd, himself, had expired in 1887 (von Mechow 2018).

It seems likely that Codd and the Rylands were all involved in the American sales unit from the beginning – although why only Codd’s name appeared in the firm’s identification is anyone’s guess. The year 1880 was four years prior to the breakup of the firm of Rylands and Codd in England, but the two remained linked in the U.S. until Codd’s death.

Containers and Marks

B. RYLAND'S BOTTLE WORKS (1873-1877)

Starfoot Station (2018) reported that “Glassware from [the 1873-1877 Hope Glass Works] period is marked ‘B Rylands Bottle Works near Barnsley.’” According to Bottles and Bygones (n.d.), the full embossing was “CODDS PATENT 4 LONDON SE B.RYLANDS BOTTLE WORKS NEAR BARNSELY” on the heels of early Codd-stoppered bottles. These bottles were almost certainly not used in the U.S.



Figure 6 – Rylands & Codd (von Mechow 2018)

RYLANDS & CODD (1877-1881)

Von Mechow (2018) illustrated “CODD’S PATENT (arch) / 4 / MAKERS (all horizontal) / RYLANDS & CODD (inverted arch) / BARNSELY (horizontal)” as found embossed on the reverse heels of bottles (Figure 6). Very few bottles with these marks were sold in the U.S., as the Codd & Co. sales outlet did not open until 1880. See the sections on Codd & Rylands and on Codd & Co. below).

CODD & RYLANDS (1881-1884)



Figure 7 – Codd & Rylands (von Mechow 2018)

Von Mechow (2018) reported two marks used by Codd & Rylands during the 1881-1884 period, both on the reverse heels of Codd-stoppered soda bottles. One was embossed “CODD’S PATENT (arch) / REISSUE / AUGUST 13TH 1878 / MAKERS / 4 (all horizontal) / CODD & RYLANDS (inverted arch) / BARNSELY (horizontal).” The second was embossed “CODD’S PATENT (arch) / 4 / MAKERS (all horizontal) / CODD & RYLANDS (inverted arch) / BARNSELY (horizontal)” (Figures 7 & 8). Most U.S. bottlers that used these Codd-stoppered sodas were located in New York



Figure 8 – Codd & Rylands (von Mechow 2018)

or nearby venues. The bottles were never popular very far from the U.S. sales outlet (see the section on Codd & Co. below). Also see the section on 4 below.

4 (1877-1884)

According to von Mechow (2018), “the Hope Glass Works used the mark of ‘4’ on its glassware to signify its products attributes of accuracy, cleanliness, neatness and strength. The markings appear on the reverse heel of the bottle.” However, it apparently was an integral part of the full marks used by Rylands & Codd as well as Codd & Rylands (see Figures 6-8)

Number in a Star (1880-1890)

According to von Mechow (2018),

the American licensed bottles have the licensed number embossed within a star and numbers between 1 and 95 are recorded. Hiram Codd held license number 1 and that may explain the wide variety of these bottles. He likely sold these to licensees for use while their private mold bottles were being manufactured and shipped from England. Number 1 bottles have been found . . . in Pensacola, Philadelphia, and other cities where Codd licenses were sold.

We add that these were large stars and numbers embossed on the front bodies of the soda bottles (Figure 9). The use of these licenses is unclear. Von Mechow suggested that these were used “while their private mold bottles were being manufactured and shipped from England.” This suggests that the licenses were to the bottler to allow another glass house to manufacture codd bottles for a very temporary period. It seems unlikely that an American plant would buy the tools and gear up to make Codd bottles – a *very* different process from other finishes – for a short time span.



Figure 9 – Number in star (von Mechow 2018)

It seems unlikely that the licenses would be to glass houses, allowing them to make the bottles – especially if we are looking at this same brief period. This is especially true since Codd specifically licensed the Whitney Brothers to make the U.S. bottles in 1886. If the licenses were restricted to the U.S., 95 bottlers or glass houses seem to be an unreasonably high number. In addition, we do not know whether these licenses were issued by Codd, himself, or by Codd & Co. Hopefully, future research can unravel this tangled skein.

DAN RYLANDS (1884-1897)

According to Von Mechow (2018), Rylands embossed “DAN RYLANDS (arch) / 4 / SOLE MAKER (all horizontal) BARNSELY (inverted arch)” on the reverse heels of his soda Codd-stoppered soda bottles during the 1884-1897 period (Figures 10 & 11). The term “sole maker” *may* indicate that these bottles were made during either the 1884-1886 or 1890-1896



Figure 11 – Dan Rylands (eBay)

periods. The Whitney Brothers produced bottles in the U.S. from 1866 to 1890. Or, it may just indicate that Dan Rylands took over the British manufacture of Codd bottles after the dissolution of Codd & Rylands in 1884.



Figure 10 – Dan Rylands (von Mechow 2018)

RYLANDS or THE RYLANDS (1897-1928)

Von Mechow (2018) reported that the Rylands Glass and Engineering Co., Ltd., used “THE RYLANDS” to mark its products from 1897 to 1928. Starfoot Station (2018) added that some were embossed “RYLANDS.” Toulouse (1971:448) illustrated the mark as “RYLANDS (slight arch) / BARNSELY (slight upside down arch)” – suggesting that the mark may have appeared on bottle bases. Collectors Weekly (2018) listed two bottles that expand our knowledge of the marks (although they included no photos). One was embossed “THE RYLANDS, 4, BARNSELY (with the commas likely indicating separate lines). The other had “PATENT SAFE GROOVE, 4, SOLE MAKERS, DAN RYLANDS LD, BARNSELY” presumably on the lower reverse.

CODD'S NO. 90 PATENT (1880-1890)

Von Mechow (2018) reported a single bottle embossed “CODD’S (arch) / NO. 90 (horizontal) / PATENT (inverted arch)” on the bottle’s base, attributing the mark to Hiram Codd & Co. during the 1880-1890 period (Figure 12). The reverse heel of one example was embossed “PAT.APRIL 29th 1873” – but another had “RE-ISS. AUG 13TH 1878.”



Figure 12 – Codd’s Patent (von Mechow 2018)

H. CODD & CO. (1880-1890)



Figure 13 – H. Codd & Co. (von Mechow 2018)

Von Mechow (2018) illustrated two marks used by H. Codd & Co. between 1880 and 1890, both embossed on the reverse heels of Codd-stoppered bottles. The earlier of the two – 1880-1886 – had the first address, although the number “23” was incorrect (it was “22”): “CODD’S PATENT (slight arch) / REISSUED AUGUST 13TH 1878 / (horizontal) / H. CODD & CO. (slight inverted arch) / 23 PARK ROW / NEW YORK (horizontal)” (Figure 13).

The second, later mark, was “CODD’S PATENT (slight arch) / PAT. APRIL 29TH 1873 / SOLE AGENTS (both horizontal) / H. CODD & CO. (slight inverted arch) / 22 COMMERCE ST. / NEW YORK (horizontal)” (Figure 14). This was used between 1886 and 1890.



Figure 14 – H. Codd & Co. (von Mechow 2018)

RYLANDS’ CLIMAX (1890s-ca. 1928)

Roller (1983:312) discussed a jar embossed “RYLANDS ‘CLIMAX’ HOUSEHOLD JAR” on the front and “PATENT” on the base. He speculated that the patent referred to on the base may have been “one of the 1886 Rylands patents for molds or glassblowing machines.” He

was unsure of the full dates of manufacture but included ads for jars from 1891 and 1906 (Figures 15 & 16). The jar was absent from Creswick. The Roller editors (2011:455) added two more variations. One was embossed “‘CLIMAX’ / RYLANDS / ‘ATLAS’ / TRADE MARKS” on the front and “RYLANDS BARNSELY 2” on the base. The other was unembossed on the front but had “RYLANDS BARNSELY” on the base.

Discussion and Conclusions

Although the relationship between Hiram Codd and the Rylands family was sometimes strained, the partnership was successful for a long period of time – even though Codd’s patented marble-stopper bottles were never a large success outside of England. The history of the firms is well researched with solid dating, including the relevant dates for almost all of the various marks used by the succession of firms.

Acknowledgments

Our gratitude to Wanda Wakkinen for her proofreading.

Sources

Bottles and Bygones

n.d. “Cods, Minerals & Sodas for Sale.”

<http://mikesherdan.tripod.com/minerals.htm>

Collectors Weekly

2018 “Codd Bottles.” <https://www.collectorsweekly.com/stories/11709-codd-bottles>

Dunn, Russell and June Dunn

1987 *Codd: The Man and the Bottle*. Privately printed, Whittlesea, England.



Figure 15 – 1891 Rylands jar ad (Roller 1983:312)

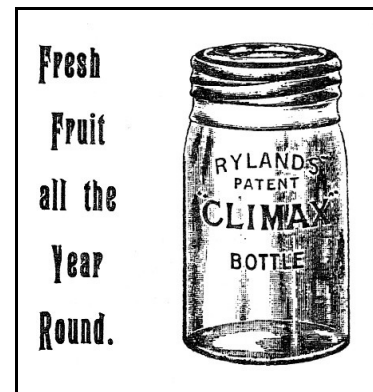


Figure 16 – 1906 Rylands jar ad (Roller 1983:312)

Lindsey, Bill

2018 “Bottle Typing/Diagnostic Shapes: Soda & Mineral Water Bottles.”

<http://www.sha.org/bottle/soda.htm>

Munsey, Cecil

2010 “Codd (Marble-In-The-Neck) Soda-Water Bottles: Then and Now!” Privately published (in Adobe format), Poway, California.

Ross, Catherine

1982 “The Development of the Glass Industry on the Rivers Tyne and Wear, 1700-1900.” Ph.D. Thesis, University of Newcastle upon Tyne.

Starfoot Station

2018 “Rylands & Codd.” <http://stairfootstation.co.uk/rylands-and-codd>

Toulouse, Julian Harrison

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

Von Mechow

2018 “Soda & Beer Bottles of North America: Bottle Attributes - Beer & Soda Bottle Manufacturers.” <http://www.sodasandbeers.com/SABBottleClosures.htm>

Wyman & Sons

1888 *Wyman’s Commercial Encyclopedia of the Leading Manufacturers of Great Britain and Their Productions Being a Guide to Merchant Buyers All over the World*. Wyman & Sons, London.

Last updated 1/11/2018