The First American Soda Fountains

by Donald Yates

As many may know, the greatest soda fountain development occurred in New York City. Americans and Europeans had a great passion and thirst for mineral water. At these great springs, spas were built, where one could drink and bathe in the mineral water.

Europe had world famous springs in England, France, and Germany. In the United States, thousands of springs had developed along with spas that were noted for their medicinal and healing attributes. Saratoga Springs in Upstate New York had several artesian geysers which are naturally effervescent, or bubbly.

These are similar to Old Faithful Geyser, except they are continuous and never take a break.

The next phase was to produce an artificial soda water. Top scientists from many nations were trying to produce carbonated soda water, which would imitate the natural mineral waters and still be safe and palatable - and profitable.

The first attempt at making soda water was done by a Mr. Thurneisser in 1560; later by a Mr. Hoffman in 1685; and by a Mr. Geoffroy in 1724. Their success was not remarkable. In 1630, Mr. Von Helmont first explained carbonic acid gas. Dr. Black, in 1757, isolated carbonic acid from all other gasses and called it "Fixed Air." Mr. Lavosier, from France, identified carbonic acid and stated that it was composed of carbon and oxygen.

In 1750, progress was made, and a Mr. Venel produced carbonic acid by combining Muriatic Acid in a solution of carbonate of soda. In 1772, Dr. Joseph Priestly first recognized that it was this carbonic acid gas that impregnated soda water.

The first carbonation patent in the U.S. was granted to Simmons and Rundell of Charleston, S.C., in 1810.

Water

The manufacture of soda water requires a pure source of water, since it will become a beverage. The water must be selected with great care and purified with equal thoroughness. The ideal water source is from a deep, cool, sparkling well, in a good location, without contamination.

Cool spring water could also be used as a source of soda water, but it must be filtered to achieve an acceptable degree of purity.

Spring Water

As rain water falls on the earth's surface, it begins to absorb the soluble particles it finds there, and gradually becomes more and more contaminated as it percolates through the different layers of the ground. It dissolves mineral compounds found locally. Due to these dissolved compounds, this water is called "Natural Mineral Water."

Croton Water

The main city well water supplying New York City was croton water. Unfortunately in the late 1800s, it became contaminated and unfit for human consumption. One of the identified organisms identified under a microscope was called epithelia. These are very common in hydrant drinking waters and can cause serious diseases, including typhoid fever, scarlatina, (Scarlet Fever) and dyptheria. The bacteria found could also cause serious diseases such as pneumonia, tuberculosis, and anthrax. The spores of anthrax consists of small spheres, which cannot be killed with common antiseptics.

Croton water must be boiled to purify it.

Early experimentation had shown that carbonic acid destroyed these bacteria, resulting in a great benefit. Common filtration materials included sand, charcoal, and sea sponges. Charcoal was special, because when properly used it renders pure water even purer, and also in an un-pure water, renders the harmful portions of organic matter harmless through oxidation.

Carbonic Acid Gas

Carbonic acid gas is the most important ingredient in the manufacture of soda water, besides pure water. All effervescent drinks' refreshing attributes, their sparking, prickling and excellent taste, depend upon the carbonic acid gas incorporated within them. Carbonic acid gas must be perfectly pure, free from air, and should not contain any disagreeable odors, such as sulfur compounds.

An ideal gas pressure for glass bottles is 45 pounds per square inch (PSI). Higher pressures present no advantage, and are dangerous to the apparatus and to the bottles. Siphons are pressurized to 130 PSI.

Carbonic acid gas was obtained by combining ground marble dust with sulfuric acid. The gas is then collected and purified by passing it up through a column of water. Chemical purification, such as bicarbonate of soda, is also very effective.

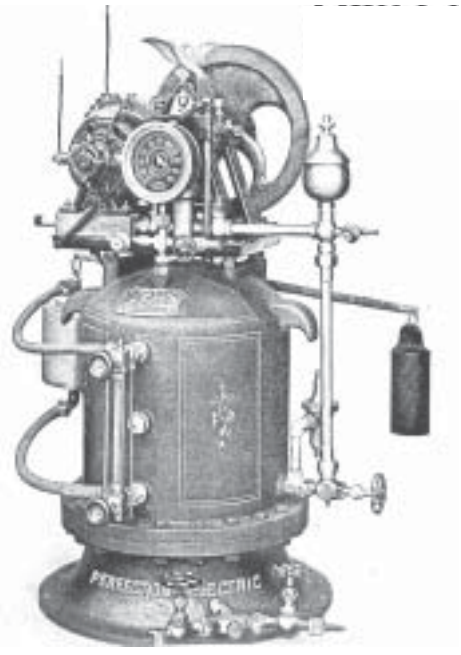
American Gas Generators

The machinery consists of a vertical carbonate feeding generator, in which the gas is produced under moderate pressure, a large round cylindrical iron gasometer, in which the gas is received, and a beverage carbonating compressor, which pushes the carbonic acid gas and the liquid into a condenser, where they are thoroughly mixed.

From the condenser, the carbonate is drawn to furnish the bottling machines or siphon fillers. Steam power was desired to operate the carbonating compressor.

The Matthews Generator

This machinery consisted of two horizontal acid feeding generators to produce the gas, three stationary fountains and a force pump for injecting the fountains with liquid, where they were charged with carbonic acid gas. Its operation was almost continuous, because each generator



1880 Liquid Cargonator

operated independently of the other. The generators and fountains were made of gun metal iron and tested to 500 PSI.

Puffer's Generator

This gas generator consisted of two generators and three cylinders with two sediment traps, two gas domes, two automatic valves, one patent regulating valve and a double acting pressure pump.

Each valve could be set to take the gas from the generator, which is charged to 200 PSI. This is the proper pressure for charging soda water fountains.

The Tuft's Generator

The Tuft gas generator consists of two generators with three purifiers, at the side, an equalizing valve, three cylinders with water gages, a pressure gauge, and an injection pump.

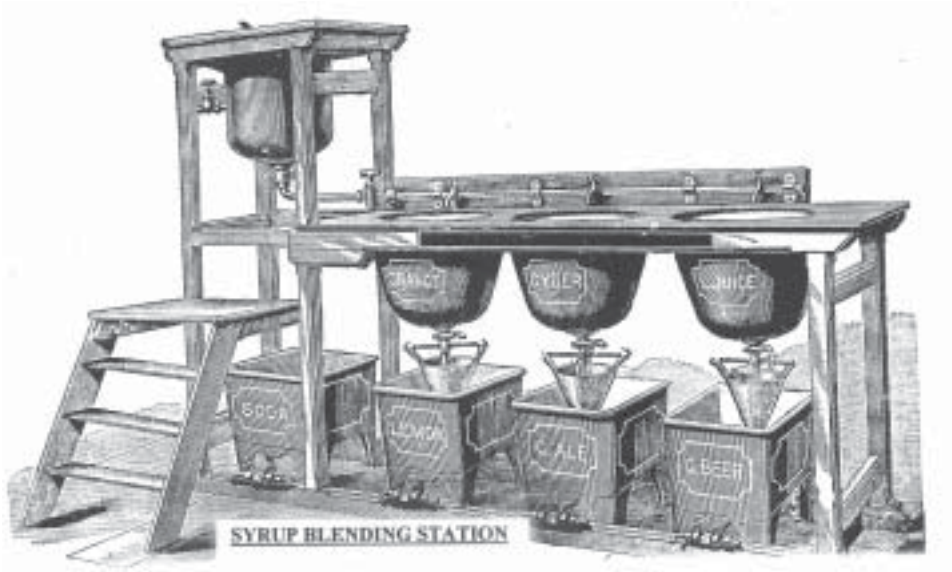
Gas is developed in the normal manner in one of the generators, and the desired volume of water was pumped into the cylinders. The equalizing valve of the first generator was set at the proper pressure by means of a pressure gauge.

The Lippincott Generator

The Lippincott equipment consisted of two generators at each end and three stationary fountains constructed of copper. The generator was acid-proof by means of a lead lining. The fountains were sanitary with a tin lining. The purifiers were controlled at the sides of the generators.

The agitators were operated with wheel cranks manually, and also used to start the agitators before shifting the belt for automatic operation.

There was a gas bell on top of the generator into which the gas rose and to which the pipes and safety relief valves were attached. This precluded the blocking of the pipes by the foaming of the carbonate. The acid valve was raised and locked by a wheel and screw conveniently located near the operator.



Bottling

Remember, these are the processes and equipment used in the late 1880s. The process of bottling carbonated beverages was almost universally performed by the means of a bottling apparatus, which rendered their manufacture more profitable.

The filling machine may have been conveniently located near the bottling machine. The length of soda pipe only had to be increased. This connecting pipe was best manufactured from pure tin, for sanitary considerations. On American bottling machines, a flexible rubber hose was attached to the unit. This hose was of high quality to withstand bottling pressure.

American Filling Machines

The Matthews filling machine was used for bottling with corks. It had a syrup gauge attached to the cork gauge which allowed all of the corks to be driven in uniformly, and to the proper depth, into the neck of each bottle.

When the cork was well in, the bottling ledge was raised enough to permit the cork to be properly secured with the cork swing fastener.

Syrup Tanks

Syrup tanks were the necessary reservoir units of the bottling machine. They contained the ready-made and flavored syrup, which fed the syrup pump and was intended for flavoring the carbonated water.

It was required, where different beverages by several continuous bottling processes were being produced, to have each kind of flavored syrup in a separate syrup tank, which could be immediately connected with the syrup gauge and bottling machine. The tanks were usually constructed of tin lined copper.

Typical 1880 Bottling

After the bottling machine was properly charged, the syrup was ready, and the bottling machine was in order. Also the corks had previously been well prepared according to the instructions:

"Place the bottle in the filler rack and press down the foot pedal until the filling head is firmly on the mouth of the bottle…

"With your right hand, raise the hand lever, and grab a cork with your left hand, and place it evenly in the cylinder. Drive the cork about half-way through the filling head and hold it there in order to close the mouth of the cylinder tightly.

"With your left hand on the syrup gauge lever, make a single stroke, holding open until the bottle fills, thus injecting the required amount of syrup into the glass

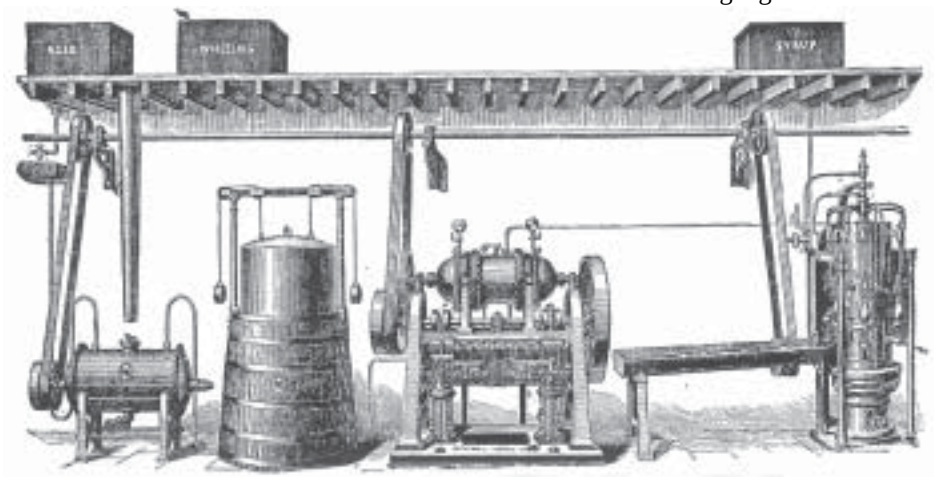


Illustration showing the general arrangement of carbonic machinery.

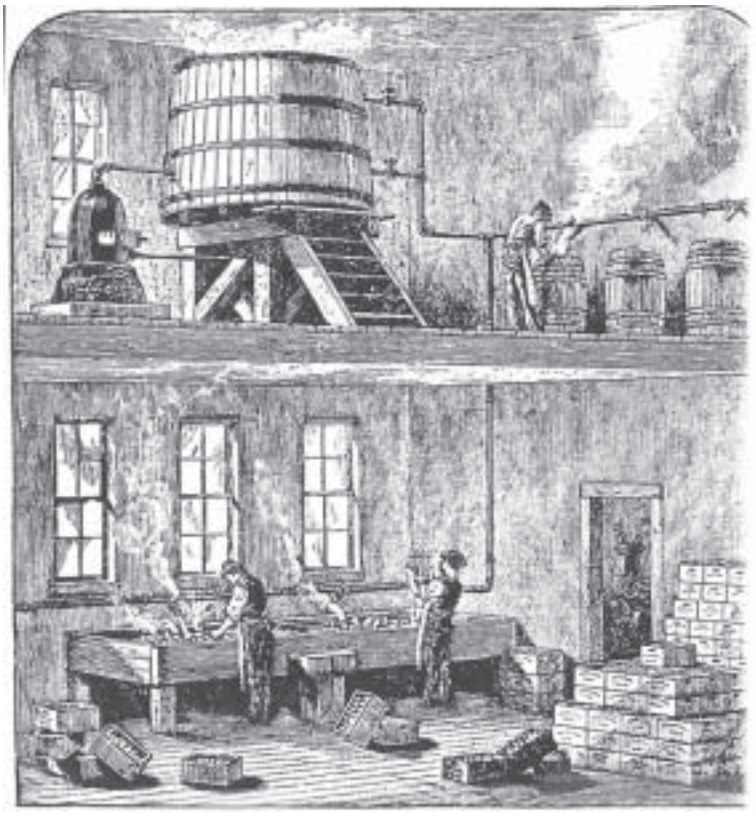
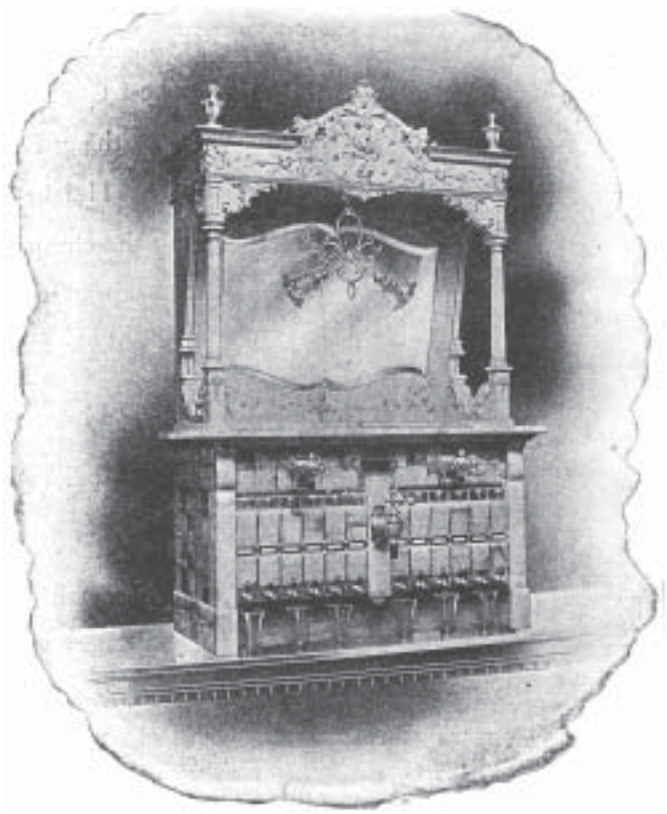


Illustration of an early bottle washing room.



Lippincott Soda Fountain

bottle and allowing it to be filled with soda pop."

The syrup gauge was pre-set to exactly the required amount of syrup. Then the gauge lever was pushed back and the cork was driven into the bottle with the hand lever. Directions continued:

"Release the foot pedal sufficiently, allowing the bottling cylinder to rise, meanwhile holding down the cork with your hand, put the wire bail securely over the cork.

"Remove your foot from the pedal and you can remove your filled bottle from the filling machine."

Apparently, this required great coordination as well as skill.

American Soda Fountains

Where large stationary counters were established, soda fountains were directly connected with the required generating equipment. It was highly recommended that a special carbonating unit be installed with two stationary fountains containing agitators.

Dispensing fountains were quite adapted for populous places of resort, in the main thoroughfare, or where traffic was great. Ideal locations included major cities, sea shores, amusement parks, and railway stations. Summer boardwalks were also ideal.

The demand for soda water was great during the summer. Some of the most delicious drinks were supplied by means of these fountains and repeat customers resulted in large profits.

Since the demand for non-intoxicating drinks was so much on the increase, the opportunity offered itself to any one who owned a shop or drug store *and* were in the position for doing a counter trade to give the experiment a trial.

It was one of the most beneficial additions to an existing business – such as an apothecary's or confectioner's, hotel or café – being ornamental and at the same time - profitable. The experiment entailed no risk beyond the purchase of the apparatus, because soft drinks were not subjected to excise tax.

Portable Fountains

Where a portable cylinder, instead of a stationary carbonating apparatus, was employed, it was attached by its connections to the draught machine. This made it ready for use, remaining in its position until empty, when a full one was transposed.

These portable cylinders would be strongly fabricated, and in all cases tested to twice the working pressure.

The American Soda Fountain Company

In 1891, Tuft's Arctic Soda Fountain Company consolidated with A. D. Puffer and Sons of Boston, John Matthews of New York and Charles Lippincott of Philadelphia to form THE AMERICAN SODA FOUNTAIN COMPANY. James W. Tufts was president.

During the Centennial Exhibition held in Philadelphia in 1876, on display were the latest inventions, gadgets and machinery. A Corliss Steam Engine was there, huffing, puffing, and larger than a residential home. If one carefully looked around, he would also have discovered a Tufts Artic Soda Fountain. James Tufts and Charles Lippincott had paid $50,000 for the exclusive rights to sell soda pop and ice cream sodas and displayed an ornate, thirty-foot high soda fountain. The fountain was fabricated from different colored marble, and had elaborate spigots, a hanging chandelier and hanging ferns.

More about the Matthews and Tufts soda fountains will be continued in future articles.

References

Book: *A Treatise on Beverages*, by Charles Herman Sulz; New York; Charles H. Sulz Publishers – 1888.

Druggists Circular; New York; June 1902.

PINEHURST BEGINNINGS by Audrey Moriarity – 1979.

Liquid Carbonic Acid Co. fountain as shown in a company advertisement.