

Weekend Break: Astoria's purple vault lights

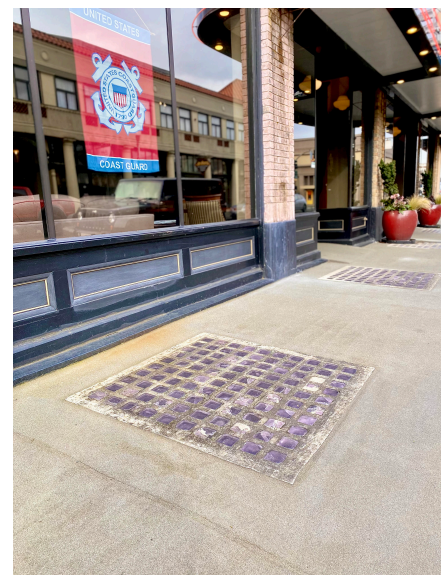
By Jaime Lump For The Astorian Mar 10, 2023



In an old sepia photo from Margaret Nadine Elliott's 1940 scrapbook, a group of children pose on the sidewalk outside the Hotel Elliott. Beneath their feet lies a panel of gridded smooth glass squares reflecting light from the afternoon sun. Today, the light still sparkles against the jagged edges of what remains of the glass squares, their fractures giving them an amethyst or rose quartz appearance. These glass panels are called vault lights, which got their name from their purpose of allowing natural light into basements that extend beneath vaulted sidewalks.

The vault lights utilized in many urban areas are a specific form of an innovation that allows daylight to penetrate subsurface areas, which traces back to 17th century wooden cargo ships. Ship builders set prismatic glass into the deck allowing natural light to enter the cargo hull. Daylighting became a widely used alternative to open flame light sources, like candles or kerosene lamps, and was considered an essential feature for ships carrying coal or gunpowder.

The earliest US patent for land use vault lights was created in 1834 by Edward Rockwell whose vision employed a large glass lens encased within a round iron frame. His lights were installed at a few locations in New York City and though successful in their execution, the delicate glass was vulnerable to damage from frequent foot and wheel traffic. If the glass was scratched, light would no longer penetrate through it effectively, or if it was broken, a pedestrian's foot could fall through the hole it would leave behind. Inventor and lawyer, Thaddeus Hyatt, pointed out these flaws in his own 1845 US patent for improvements on Rockwell's design: "I have so constructed my illuminating vault-cover, as to admit the light through a considerable number of small glasses, or lenses, which are set into the iron cover, as effectually to defend them from injury by the falling or pressure of weighty bodies upon them..." Hyatt's lights became a hit all around the country.



The ingenuity of replacing one large lens with smaller, thicker pieces of glass sustained the integrity of the sidewalk's safety. For building owners, vault lights added to property value and saved them considerable costs for electricity, which, at that time, was new and rather expensive. Hyatt became a successful and well-respected man, but his contributions to American history didn't stop at vault lights.

The late 19th century was a time when several major US cities faced great fires. Hyatt was determined to come up with a solution to fireproof construction. In his experiments, he found that materials like iron and concrete were not effective against fire on their own, but in the form of reinforced concrete, these materials were considered fireproof. After Hyatt published his work in the late 1870s, reinforced concrete buildings began to pop up all over the country including, New York, Illinois, and California. Astoria had faced its own fire disasters, including the great 1922 fire, which destroyed over 30 blocks of its downtown business district. Prior to the tragic event, Astoria's early 1920s infrastructure remained a bit behind the times. The downtown landscape stood atop the tide flats of the Columbia River, and it wasn't until 1916, that a resolve to fill in that area began with the construction of a rocky seawall along the waterfront. This advancement led to city engineers raising the buildings and streets by four feet, allowing for buildings to have functional basements, but despite these improvements, builders continued to rely heavily on the abundance of timber to construct buildings, sidewalks, and streets. This choice ultimately accelerated the destruction of the new structures in the extensive 1922 fire.

After the fire, Astoria's downtown followed a new plan: 'From Ashes to Concrete.' The city manager and engineers were determined to build not only a fireproof city, but a modern city. For Astoria, a modern city meant building with reinforced concrete. The concept of the seawall was improved upon with the chairwall system, which extended basements to the space beneath the sidewalks. In 1924, concrete sidewalks were poured by local contractors Solheim & Gustafson. Sidewalk stamps crediting their work can be seen all over downtown. It was at this time that panels of gridded glass, produced by Cress & Co. of Portland, were installed along nearly every block so that basements and utility passageways would be illuminated with daylight.

Over time, vault light glass began to turn purple from years of exposure to sunlight, and this 'solarization' seemed to happen everywhere. Even in Astoria there was enough sun for this transformation to occur. But, what exactly is solarization? On an elemental level, glass is made from silicon dioxide, or silica, which is colorless. Impure batches of silica contain iron, imparting a greenish tint to the glass. To resolve this, glass makers used manganese dioxide as a decolorizer, a method that dates back to 2nd century BC. It was once thought that the decolorizer was 'scrubbing' the color away from the material. In fact, 17th century glass



books refer to manganese dioxide as “glass maker’s soap.” However, when combined, the manganese chemically reduces while simultaneously acting as an oxidizing agent to the iron, rendering them both colorless. In turn, when exposed to ultraviolet light for extended periods, the reduced manganese becomes photo-oxidized, or ‘solarized,’ converting it back to its oxidized form, giving it the recognizable purple color that is seen in the vault lights today.

Vault lights ultimately fell out of fashion around the 1930s when electric lights became more common and more affordable. For nearly one hundred years pedestrians have been walking across the purple squares leaving them in various states of decay. Many Astoria vault light panels continue to line the sidewalks of Commercial and Duane streets as well as along the numbered side streets. A couple panels remain in great condition, and have been enhanced with lighting from beneath providing a warm and welcoming glow to the downtown sidewalks. For some building owners, the priority of safety has led to the difficult decision of removing the panels altogether and filling in the spaces with concrete. Occasionally, panels have managed to escape the fate of the landfill. A few can

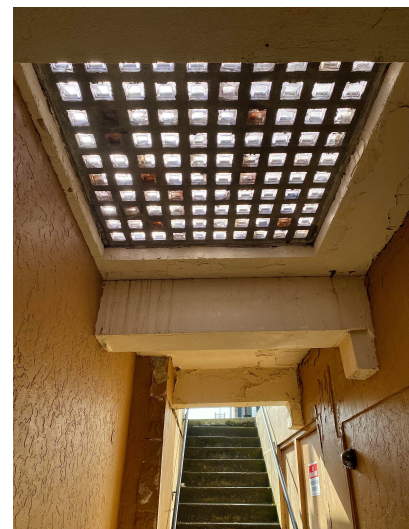


be seen on display at the Astoria Underground Tour. Early last year, Kate Speranza created “Astoria Underfoot” from glass she acquired from a discarded panel. The collection includes 100 brooches that represent a grid of 100 squares of Astoria’s historic sidewalk vault lights. She explains, “I am fascinated with the history that is imbued within architectural structures and surfaces, and I find inspiration in the inevitable patina that develops through human interaction, age, and the elements... Ultimately, I wanted to honor the history of this glass that has been tread upon for 100 years. The state of the sidewalk grids as they are today are evident of that history and so capturing the overall look of the squares that have been fractured, replaced or filled

in with other materials, the accumulated debris, and plant life (moss) were all elements I wanted to include in the gridded installation.” Speranza’s work can be found at the Riversea Art Gallery in downtown Astoria.

Additional projects to help preserve the history of the lights have been facilitated by local nonprofits including a podcast by the Lower Columbia Preservation Society and a restoration grant opportunity at the Astoria Downtown Historic District Association.

Astoria is a place to experience history hands-on, where you can drink a beer in a century old auto showroom or shop for toys in a



1916 building that survived a great downtown fire. Or, you can take a walk downtown to see the century-old vault lights. There are a few places that especially highlight the history of the panels. The sidewalk in front of the Silver Salmon Grille shows the lights in their best condition. You can find an example of a replacement panel by the Hobson Building. And, for a look at the vault lights glowing from below, see the area by the Doughboy monument. Everywhere one looks, there is a story to be told.