

Troy Gas Light Company, Gasholder House
Northwest corner of Jefferson Street and
Fifth Avenue (formerly Fifth Street)
Troy, Rensselaer County,
New York

HAER No. NY-2

HAER
NY, 42-TROY,
6.

PHOTOGRAPHS
WRITTEN HISTORICAL AND DESCRIPTIVE DATA

Historic American Engineering Record
Office of Archeology and Historic Preservation
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HISTORIC AMERICAN ENGINEERING RECORD

TROY GAS LIGHT COMPANY, GASHOLDER HOUSE
HAER No. NY-2

Location: Northwest corner of Jefferson Street and Fifth Avenue (formerly Fifth Street)
Troy, Rensselaer County, New York
Latitude: 42° 43' 17" N. Longitude: 73° 41' 27" W.

Date of Erection: 1873

Designer: Frederick A. Sabbaton, engineer

Present Owner and Occupant: Sage Maintenance and Repainting Corporation

Present Use: Storage of heavy equipment

Significance: The building of the former Troy Gas Light Company is one of the few remaining examples of a type common in Northeastern urban areas. It was designed by Sabbaton who was a prominent gas engineer in New York State. Originally sheltering an iron holder for coal gas, the brick gasholder house is an imposing structure from a significant period in the history of Troy. The handsome brick exterior reflects the standing of the company that for twenty-seven years held a monopoly on the manufacture of illuminating gas in the city.

PART I. HISTORICAL INFORMATION

A. Physical History

1. Engineer: Frederick A. Sabbaton (1830-1894), a specialist in the construction of gas works, was superintendent of the Troy Gas Light Company from 1862 to 1890. A gas engineer well-known throughout New York State, Sabbaton came from a prominent family of engineers. His father, Paul A. Sabbaton, a close friend of Robert Fulton, prepared plans and specifications for the Clermont, and at the time of his death was also a gas works engineer. Frederick Sabbaton's two brothers and his two sons were all employed as gas engineers. Sabbaton at various times supervised, constructed, and owned gas works in Connecticut, Massachusetts, and throughout New York State. He was also involved in the manufacture of aniline colors (which were made from coal tar) and designed a gas governor valve.

2. Original and subsequent owners: In the block on which the structure is situated, the Troy Gas Light Company owned lots 55 through 79. The gasholder house itself was situated on lots 71, 73, 75, 77 and 79.

1866 12 November 1866 20 November 1866
Liber 134

Maria J. Cushman
to
Troy Gas Light Co.

(Lots 57, 59, 61, 63, 65, 67)

1866 14 November 1866 10 December 1866
Liber 134 Page 369

Jonas C. Heart
and
Catharine, his wife
to
Troy Gas Light Co.

(Lots 69, 71)

1867 22 January 1867 2 February 1867
Liber 134 Page 536

Thomas B. Carroll
and
Caroline B. Carroll
to
Troy Gas Light Co.

(Lots 73, 75)

1867 6 February 1867 13 March 1867
Liber 133 Page 79

William S. Sands
and
Eliza, his wife
to
Troy Gas Light Co.

(Lots 77, 79)

1943 19 October 1943 20 November 1943
Liber 686 Page 167

New York Power & Light Corp.
to
Oscar C. Buck

1968 29 April 1968
Liber 1196

24 May 1968
Page 252

Oscar C. Buck
to
Sage Maintenance & Repainting Corp.

(Records in the Rensselaer County Recorder's Office,
Troy, New York.)

3. Original purpose and construction: A gasholder house is a structure that surrounds an iron gasholder, in which gas is stored until needed. Originally most gasholders were constructed without houses. In the early 1870's, however, the construction of the gasholder houses began in upstate New York, following a practice already fairly common in the Northeast, particularly New England. The gasholder house in Troy bears a builder's plaque dated 1873, and the structure appears on an insurance map published in 1875.

Gasholder houses were constructed for a variety of reasons. The structure protected the iron holder from the elements and enabled it to be built of thinner plates since the holder itself would not have to withstand wind pressure. Wind pressure acting on one side of the holder; snow loads on the top of the holder; and icing of the guide and counterbalance pulleys all tended to interfere with the holder's free and consistent vertical movement. The enclosure also prevented freezing of the water in the holder pit that formed a seal to prevent loss of gas, while allowing the holder to rise and fall. There is some belief too that enclosing the holder would allay the fears of the timid, anxious about explosion. The house was also considered an economical measure by reducing the condensation of gas in the cold weather and was seen as an attractive architectural element of the gas works complex.*

* Gasholder houses were constructed in England as early as about 1825, although the mild climate would not commonly necessitate them. Recently, at the demolition of a small circular house at the Bean Ing wollen mills in Leeds, researchers were able to discover that only two other gasholder houses (and a possible third) had been built in the country. The Bean Ing house was 40 feet in diameter, of brick, with an iron-plate domed roof supported by sixteen T-shaped iron ribs. (Architectural Review, November 1970, pp. 275-76.) A very large brick gasholder with house was built at Erdberg, near Vienna, in 1886, the house having an inside diameter of 208 feet. (Scientific American Supplement, 26 March 1887, pp. 9354-55.)

Gasholders still are sometimes called "gasometers," an old-fashioned term surviving the industry's early period when the holder also was used to measure the gas by graduations on the tank's side. By the 1870's the term gas-holder was preferred since separate meters were then in use for measurements. The Troy Gas Light Company had been using meters since at least 1855, if not before.

Iron gasholders were usually double- or single-lift types, although a triple-lift type was also constructed by some companies. A contemporary source described how the holders looked and worked:

To the untutored eye they present the appearance, when fully distended, of circular castles or forts, without portholes, embrasures or sally ports, or to the less military mind they might suggest sections of two enormous boilers, one sliding within the other, and set vertically into the ground. This [ground] tank [or pit] contains sufficient water to prevent the gas from escaping under the edge of the holder. When exhausted, the sections slide one within the other, like a telescope when shut up, and the whole affair sits down in the tank so that the top is nearly on a level with the surface of the ground. As the gas is let in and the pressure increases, the huge iron cylinders rise up and the inner one slides up until the holder is fully extended. These are called telescopic holders. Some are made with only a single section, or "single lift" as it is called. The average dimensions of holders approximate seventy feet in diameter with height of about 60 feet, and a capacity of less than 850,000 feet. (New York Times, 7 April 1872).

The Troy holder was a telescoping two-lift type. Its top section had a diameter of 100 feet and a height of 22 feet, and the lower section had a diameter of 101 feet 6 inches and a height of 22 feet. It had a capacity of 333,000 cubic feet of gas. The weight of the holder provided the pressure of the gas in the mains; at the Troy holder the pressure was 4-1/2 inches.*

* The pressure of the gas in the mains was too low to be practically measured by the conventional pressure standard of pounds-per-square-inch; and so was expressed, rather, in terms of height of a column of water, in inches, that the pressure would support; i.e., so many "inches" (of water column).

The gas passed through inlet and outlet lines twelve inches in diameter.

The underground tanks of the gasholders were made of stone, brick, concrete, and cast or wrought iron. The brick tank under the Troy holder had a diameter of 103 feet-2 inches and was 23 feet deep. Together the Troy holder tank, and house were valued in 1892 at \$68,093.95.

Of the eight or ten gasholder houses that survive in upstate New York and New England, all either are known to have been built in the decade of the 1870's or appear to have been with the exception of one in Concord, New Hampshire dated 1888.* The various mechanical problems resulting from the cold climate that the house was intended to alleviate all were ultimately overcome--far more cheaply--by improved technology.

4. Alterations and additions: Originally the gasholder house had a small, one-story brick porch located in the center bay of the south side facing Jefferson Street. The porch has been removed but the markings on the brick of the gasholder house wall suggest that the porch had a gabled roof. Judging from other gasholder houses extant in New England, this room was used for an entranceway and as a governor room. According to an 1875 atlas, the house originally had "windows all around"; some of these have been bricked in. The present owners have cut a large entrance into the central bay of the north side for truck access. By 1892 a boiler house and a purifying house had been constructed north of the gasholder house; in 1910 a separate governor house was built.

* Known Gasholder Houses

<u>Location</u>	<u>Date</u>	<u>Material</u>	<u>Present Use</u>
1. Salem, Mass	1873	Brick	Houses disused gasholder
2. Attleboro Falls, Mass.		Brick	Storage
3. S. Boston, Mass.			Houses disused gasholder
4. Valley Falls, R.I.		Stone	Utility company garage
5. Warren, R.I.		Brick	Utility company garage
6. Concord, N.H.	1888	Brick	Houses disused gasholder
7. Concord, N.H.		Wood	Houses disused gasholder
8. Seneca Falls, N.Y.		Brick	Automobile showroom
9. Troy, N.Y.	1873	Brick	Warehouse and garage
10. Syracuse, N.Y.		Brick	Glass and paint store
11. (Albany, N.Y.		Brick	Utility company garage Demolished 1971)

The gasholder house at Jefferson Street was in operation in 1912, and was probably taken out of service during the 1920's when a new central plant was built at Menands. In 1930 the holder itself was removed and sold as scrap metal. The house was subsequently used for storage by Oscar C. Buck, a circus manager, and for marching practice by local bands. It is used for storage and as a garage by the present owner. The works at Liberty Street was in service in 1892 but not in 1912, when it probably had been superceded by a new works built at Smith Avenue.

The Troy Gas Light Company, which first supplied the city with illuminating gas in 1848, maintained a monopoly for the manufacture of gas in Troy until 1875 when the Troy Citizens Gas Light Company was founded. Ten years later, in 1885, the Troy Fuel Gas Company was founded. On 11 October 1889 these three companies were consolidated to form the Troy Gas Company. The Troy Electric Light Company, founded in 1886, also merged with the Troy Gas Company about 1893, followed by the merging of the Beacon Electric Light Company in 1908. In 1826 the Troy Gas Company joined with the Mohawk Hudson Power Corporation, which in turn joined with the Niagara-Hudson Power Corporation in 1929.

B. History of the Physical Plant

The Troy gasholder and its house were just one facet in the manufacture of illuminating gas. The other elements of the works of the Troy Gas Light Company were located about two blocks northeast of the holder on the irregularly-shaped block bounded by Liberty, Fifth, Hill, and Washington Streets and by the tracks of the New York Central Railroad. This block was the original site of the works of the Troy Gas Light Company, which was chartered in 1848.

At the time the gasholder house was constructed, there were several buildings used for the manufacture of coal gas on that block. Extending along Fifth Street to the corner of Liberty Street was a coal shed. It was rectangular in plan, approximately 200 feet along Fifth Street and 34 feet along Liberty. The shed was of brick, with iron doors along Fifth Street; it had a wooden cornice, measured 28 feet to the eaves and had a skylight* running the entire length of the roof.

* Although the Sanborn map (1875) indicated "skylight," it would be more reasonable to assume that it was a "monitor" for the following reasons: (1) there was need for ventilation of the stored coal; (2) there was no need for light; (3) it was uncommon for a skylight to run the full length of a roof; (4) a non-technical map publisher might be apt to call a monitor a skylight; and (5) the same atlas indicates that the roof of the Rensselaer Iron Works rail mill also contains a "skylight," shown on both buildings by the same convention (parallel dotted lines). The rail mill had a monitor roof at that time.

Adjoining the south end of the coal shed was the heart of the system, the retort house, trapezoidal in plan, measuring roughly 200 feet by 50 feet, with its longitudinal axis running east to west. A brick structure with iron roof beams, this building measured 22 feet to the cornice, which was of brick or metal. In the retort house the coal was burned to produce crude gas.

Fronting on Hill Street and adjoining the retort house at its southwest corner was the condenser building. This was a small rectangular brick building of one story, approximately 10 by 20 feet with a brick or metal cornice. In the condensers tar was separated from the crude gas.

Adjoining the condenser building on the north was the exhauster building, which contained a 12 horsepower engine to drive the exhauster, or pump, that forced the gas through the system and ultimately into the holders. Opening off the north side of that building was another small building housing a 75 horsepower steam boiler. These two buildings were also of brick and were one story high.

In the open space in the center of the block, north of the retort house and west of the coal shed, there were two iron gasholders, each approximately 50 feet in diameter, neither protected by a gasholder house.

At the northwest corner of the lot was the purifying building, where sulphur was removed from the gas. This building was a two-story brick structure with an iron roof and a brick or metal cornice. The building measured approximately 35 feet by 40 feet. Adjoining this building on the south was a two-story brick structure containing the meters and the steam-heated office.

At the south end of the lot was another coal shed. This was also of brick and measured 24 feet to the cornice. A tar well also was located there. In the 1870's the company burned gas coal supplied by Freeman Butts of Cleveland, Ohio. All the buildings on the block described above have been razed; only portions of a brick wall now remain.

The Company also had a coal shed on a dock at the foot of Division Street, one block north and seven blocks west of the works. Approximately 130 feet north of the gasholder house was another coal shed, which still stands. It extends from Fifth Avenue west to the alley, a distance of approximately 100 feet, and is about 30 feet wide. Between that shed and the gasholder house there originally were gas pipes scattered about. The area was enclosed by picket and board fences.

C. Sources of Information:

1. Unpublished sources:

"History Diagram, Drawn by K.W. Heldt, Jan. 1932, Drg. No. 2236-40, Niagara Hudson System, Western, Central & Eastern Division, Northern New York Utilities Inc." Public Relations Office, Niagara-Mohawk, State Street, Albany, New York.

Interview with Mr. McColl, Niagara-Mohawk Power Corp., North Albany, New York.

P.S.C. Case 2682. "In the Matter of the Application of the TROY GAS COMPANY under section 69 of the Public Service Commission Law for authority to issue Capital Stock and convertible notes." State of New York, P.S.C. 2d District, Division of Capitalization, Report, November 10, 1913.

Plaque on the gasholder house, dated 1873, which states that E. Thompson Gale was president and T.W. Lockwood was treasurer of the Troy Gas Light Company, and that F.A. Sabbaton was the engineer.

2. Published sources:

American Gas Light Journal and Chemical Repertory
XVIII (May 2, 1873), 148-149, and XX (May 2, 1874), 157.

Anderson, George Baker. Landmarks of Rensselaer County. Syracuse: D. Mason & Co., 1897.

City Atlas of Troy. Philadelphia: G.M. Hopkins, 1881.

"Gas and Gas-Making," Harper's New Monthly Magazine
XXVI, 14-28.

Insurance Maps of the City of Troy, New York, Including West Troy and Green Island. New York: D.A. Sanborn, 1875.

New York Times, April 7, 1872.

R.D. Wood & Co. Water & Gas Works Appliances. Philadelphia, 1896.

Rules and Regulations of the Troy Gas Light Company, for the Introduction of Gas and for Extensions and Alteration of Gas Fittings... Troy: Troy Gas Light Co., 1855.

Troy Directory. 1861-1894.

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Weise, A.J. History of the City of Troy. Troy:
William H. Young, 1876.

Weise, Arthur J. Troy's One Hundred Years 1789-1889.
Troy: William H. Young, 1891.

Prepared by Diana S. Waite
Architectural Historian
September 1969

Additional notes by Charles Granquist and
Robert M. Vogel
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PART II. ARCHITECTURAL INFORMATION

A. General Statement:

1. Structural character: This is one of the largest gas-holder houses still standing in the United States. None of the original gasholder remains except the guide rails and pulleys. The tank has been filled in, leaving only the space above grade level for use.
2. Condition of fabric: Average to poor.

B. Description of Exterior:

1. Over-all dimensions: With an outside diameter of 109' 2", this cylindrical structure has 10 bays and a low profile dome surmounted by a cupola. It is one story and measures 47' 11" to the top of the brick cornice.
2. Foundations: Not accessible, probably stone.
3. Wall construction, finish, and color: The exposed, red brick bearing walls are of running bond with a header course every seven courses. The bricks have the following identifying marks: MB, RBco, and BLEAU.
4. Structural system, framing: The wrought iron trusses were (probably) fabricated by Phoenix Iron Company, Philadelphia. There are twenty major trusses and twenty minor trusses radiating from a central point. The bottom tensile chords are adjustable, and the trusses are supported on the circular brick bearing wall which has pilasters at the truss bearing points. Each truss has a 1:7 span depth ratio.

5. Porch: Stone foundations give an indication of a brick porch or anteroom originally at the south entrance.
6. Openings:
 - a. Doors and doorways: The original wooden frame and door are on the south face, but a later wooden frame and door were added on the north.
 - b. Windows: The frame and sash of the double hung windows are of wood. The glass is boarded up at present.
7. Roof:
 - a. Shape and covering: The low dome is covered with 1/32- to 1/16-inch galvanized iron trapezoidal panels, overlapping by 2 inches with stitch rivets 1 inch on center. They are stitch riveted to purlins 11 inches on center.
 - b. Cornice and eaves: Brick corbelled cornice with galvanized metal eaves.
 - c. Cupola: With an outside diameter of 19' 2", the cupola of galvanized sheet iron is divided into 20 bays. There are double hung, wooden windows in alternate bays. The alternate blind panels are painted with windows in imitation of the actual ones.

C. Description of Interior:

1. Floor plan: Circular plan 104' 0" in diameter. The original level or flooring is not available as the building has been filled with blast furnace slag to the level of the exterior grade. The original tank floor would have been deep enough to accommodate the gasholder sections which were approximately 46' in depth.
2. Stairway: Leading to the level of the trusses at the cornice, the stairway is cantilevered from the interior wall. It is supported by cast iron brackets and has wood treads and cast iron handrails. There is a radial catwalk leading from the balcony to the cupola.
3. Special decorative details: The brickwork embellishment provides the most apparent structural decoration, especially the bracketed cornice. By means of two rows of windows, beltcourse, piers, and pilasters, a well-proportioned, two-story illusion is created. The bricks of the beltcourse and pilaster capitals are diagonally

laid to form a sawtooth moulding. Shallow brick hoods accent the window arches. The metal cupola concisely repeats the rhythm of the brick wall surface and supports a weathervane.

D. Site and Surrounding:

1. Setting: Northwest corner of Fifth Street and Jefferson Avenue; original entrance on south tangent. In an area of mixed use, principally commercial and low-income residential.
2. Outbuildings: Northwest of the gasholder house is a brick building, of no particular significance, with timber trussing, 6 bays by 12 bays. At present it is used as a warehouse; the interior has been recently remodeled.

Prepared by Richard J. Pollak
Professor of Architecture
Ball State University
18 June 1969

PART III. PROJECT INFORMATION

These records were prepared as part of the Mohawk-Hudson Area Survey, a pilot study for the Historic American Engineering Record which was established in 1969 under the aegis of the Historic American Buildings Survey. The project was sponsored jointly by the National Park Service (Historic American Buildings Survey), the Smithsonian Institution (National Museum of History and Technology), the American Society of Civil Engineers (National Headquarters and Mohawk-Hudson Section), and the New York State Historic Trust. The field work and historical research were conducted under the general direction of Robert M. Vogel, Curator of Mechanical and Civil Engineering, Smithsonian Institution; James C. Massey, Chief, Historic American Buildings Survey; and Richard J. Pollak, Professor of Architecture, Ball State University, Project Supervisor; and with the cooperation of the Department of Architecture, Rensselaer Polytechnic Institute.