

THE NATIONAL
CYCLOPÆDIA OF AMERICAN
BIOGRAPHY

BEING THE
HISTORY OF THE UNITED STATES

AS ILLUSTRATED IN THE LIVES OF THE FOUNDERS, BUILDERS, AND DEFENDERS
OF THE REPUBLIC, AND OF THE MEN AND WOMEN WHO ARE
DOING THE WORK AND MOULDING THE
THOUGHT OF THE PRE-
SENT TIME

EDITED BY
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REVISED AND APPROVED BY THE MOST EMINENT HISTORIANS, SCHOLARS AND
STATESMEN OF THE DAY

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HOLLY, Birdsall, inventor and manufacturer, was born at Auburn, N.Y., Aug. 8, 1822, son of Birdsall and Comfort (Parker) Holly, and a descendant of Samuel Holly, who was at Cambridge, Mass., in 1639. From Samuel and his wife Elizabeth —, the descent was through John and Mary —; Samuel and Mary Close; Joseph and Waitstill Webb; Sylvanus and Rebekkah Barnes, and Sylvanus and Mary Birdsall, the grandparents of Birdsall Holly. His father was a mechanic and the son early adopted the same vocation, serving his apprenticeship at Seneca Falls, N.Y. When a young man he went to Uniontown, Pa., where he first became superintendent and later proprietor of a machine shop. Returning to Seneca Falls, he engaged in the manufacture of hydraulic machinery as a member of the firm of Silsby, Race & Holly and while associated with this firm invented the Sybills steam fire engine and a rotary pump. In 1859 he removed to Lockport, N.Y., where he organized the Holly Manufacturing Co. for the manufacture of sewing machines, skeins and boxes, flat irons, sinks and many other articles of brass and iron. Later the company engaged in the production of eistern pumps and rotary pumps on a large scale, necessitating a larger and more modern factory. A further expansion of the business resulted from Holly's invention of a water works system based on the principle of pumping water under pressure into underground mains, which rapidly came into wide use. The demand from cities throughout the country for the new system taxed the facilities of the Holly Manufacturing Co. and its shops had to be more than doubled. At the time of Holly's death the company he had founded was capitalized at \$1,000,000, had a plant covering two city blocks and 500 employees, and had placed his water works system in over 2000 cities and towns in the United States and Canada. He was consulting engineer to the company until his death. While he was best known for his system of water works, the last seventeen years of his life were devoted largely to the development of his ideas for district steam heating from a central station through pipes laid underground. When he first conceived this scheme in 1876 he improvised a boiler in the basement of his home in Lockport and laid a continuous 700 foot line of pipe in wooden conduits around his back yard and the adjoining property. When steam was turned on the installation functioned perfectly. Holly then had his residence fitted up with crude coils of pipe into which steam was fed through a distributor in the attic. A loop in the basement served as a trap and returned the condensation to the boiler. This demonstration likewise was a success and convinced Holly that

buildings over a wide area could be heated by steam from a central plant. After much discouragement he secured the necessary financial aid from Lockport men and in 1877 organized the Holly Steam Combination Co., Ltd., of which Samuel Rogers was president and Holly chief engineer. A plant was immediately erected, the laying of steam pipes was begun, bored out wooden water pipe being used for the insulation, and the principal residences, churches, hotels and other buildings in the district were equipped with coils and connecting pipes. The system was inaugurated at Lockport in the fall of 1877. Within an hour after steam was turned into the mains the coils in every building were hot, steam gauges showing a loss of but two or three pounds. With this demonstration the system was pronounced a success. Despite a number of suspensions of service, due to mechanical difficulties, during the first winter (1878) the company extended the service and in the same year, as news of this radical departure in heating spread, the company was called upon to make similar installations at Auburn, N.Y., Garden City, N.Y., and the U.S. soldiers' home in Dayton, Ohio. Charles G. Emery (q.v.), a noted engineer, was sent by New York city capitalists to Lockport to investigate the new system and his report to his principals resulted in the installation in New York city of what became the largest plant in the world for the distribution of steam for power and heating purposes. Various other cities soon placed district steam heating contracts with the Holly Steam Combination Co., the size of the installations ranging from one and one-half to sixteen miles of underground pipe. Because of the rapid growth of the industry the company was reorganized Nov. 27, 1880, as the American District Steam Co., capitalized at \$10,000,000, of which David F. Bishop was president and Holly engineer. At first heat was sold at a flat rate, resulting in an excessive use of steam. To correct this abuse Holly designed a meter which showed that many customers were using twice as much steam as they required for satisfactory service and the installation of meters in the various buildings abruptly terminated the waste. He also designed a sheet metal radiator to take the place of the crude coil boxes used in the early district steam heating systems and later developed an iron pipe atmospheric radiator, hundreds of which were made and sold to district heating plants throughout the country. Altogether he received over 150 patents, including a number issued by European countries, covering much of the equipment used in district heating. He retired as active engineer of the American District Steam Co. in 1888, continuing as consulting engineer until his death. He was married twice: (1) in 1840, to Elizabeth Fields, by whom he had three children: Edgar, Frank and Clarence; (2) in April 1868, to Sophie, daughter of Samuel Haas, by whom he had five children: Mabel Louise, wife of James Broadbent; Birdsall Alanson; Norman Lewis; Howard Shuler, and Edith Antoinette Holly, wife of Frank Broadbent. His death occurred at Lockport, N.Y., Apr. 27, 1894.



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BIRDSALL HOLLY