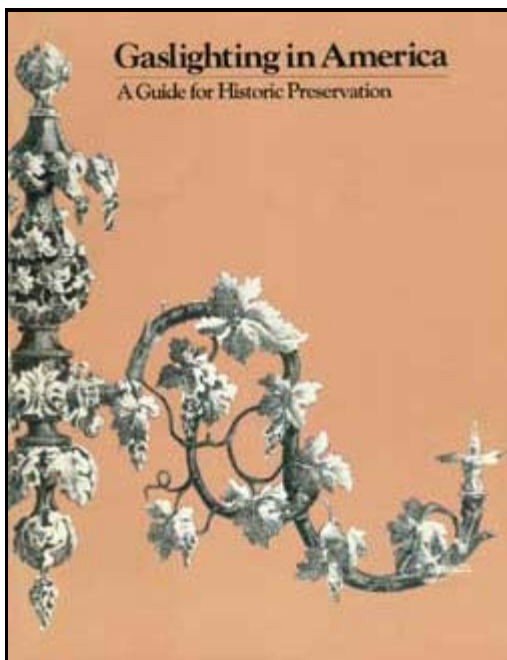


NATIONAL PARK SERVICE

Gaslighting in America

A Guide for Historic Preservation



GASLIGHTING IN AMERICA

A Guide for Historic Preservation

By
Denys Peter Myers

1978

©1978 Denys Peter Myers

U.S. Department of the Interior
Heritage Conservation and Recreation Service
Office of Archeology and Historic Preservation
Technical Preservation Services Division
Washington, D.C.

TABLE OF CONTENTS

[myers/index.htm](#)
Last Updated: 30-Nov-2007

NATIONAL PARK SERVICE

Gaslighting in America
A Guide for Historic Preservation



TABLE OF CONTENTS

[Cover](#)

[Foreword](#)

[Acknowledgements](#)

[List of Plates](#)

[Introduction](#)

[Plates](#)

[Appendix](#)

[Notes](#)

[Bibliography](#)

[Index](#) *(omitted from the online edition)*

LIST OF PLATES *(all plates in PDF format, except as noted)*

[Frontispiece](#): View of Boston and Sandwich Glass Company Exhibit, 1878. *(JPEG format)*

[1](#) Fixtures in Accum's treatise on gaslighting, London, 1815.

[2](#) Fixtures in Accum's treatise on gaslighting, London, 1815.

[3](#) Gas burner types developed by 1820.

[4](#) Fixtures from unidentified English catalogue, ca. 1820-1830.

[5](#) Fixtures from unidentified English catalogue, ca. 1820-1830.

[6](#) Fixtures from unidentified English catalogue, ca. 1820-1830.

[7](#) Fixtures from unidentified English catalogue, ca. 1820-1830.

[8](#) Fixtures from unidentified English catalogue, ca. 1820-1830.

[9](#) Fixtures from unidentified English catalogue, ca. 1820-1830.

- [10](#) Fixtures from unidentified English catalogue, ca. 1820-1830.
- [11](#) Fixtures from unidentified English catalogue, ca. 1820-1830.
- [12](#) A Boston ballroom, ca. 1838.
- [13](#) White House East Room chandeliers, 1834-1873.
- [14](#) Watercolor of a Philadelphia interior with a ca. 1841 pendant with lamp.
- [15](#) Cornelius "Gas Fittings," 1846, from T. U. Walter and J. J. Smith, *A Guide to Workers in Metal and Stone*.
- [16](#) Interior of Broadway Tabernacle, New York City, 1847.
- [17](#) Woodville's painting "Politics in an Oyster House," 1848.
- [18](#) Chandelier with Morning-Glory patterned branches, ca. 1850.
- [19](#) Chandelier with Morning-Glory patterned branches, ca. 1850.
- [20](#) Chandelier with cased glass vase and bowl, ca. 1850.
- [21](#) Archer and Warner grapevine patterned gaselier, 1850.
- [22](#) Archer and Warner grapevine patterned gaselier, 1850.
- [23](#) Archer and Warner grapevine patterned gaselier, 1850.
- [24](#) Rococo chandelier, ca. 1850.
- [25](#) Parlor gaselier, ca. 1856.
- [26](#) Allegorical gaselier, ca. 1853.
- [27](#) Engraving of Cornelius and Baker fixtures shown at the International Exhibition in New York City, 1853-1854.
- [28](#) Elaborate chandelier, probably by Cornelius, ca. 1849.
- [29](#) Ball scene with supplemental lighting, New York City, 1863.
- [30](#) Store lighted by gas pillars, 1854.
- [31](#) Chandeliers with unshaded burners, 1861.
- [32](#) Gas table lamp, 1855.
- [33](#) Fixtures by Starr, Fellows and Company, ca. 1856.
- [34](#) Fixtures by Starr, Fellows and Company, ca. 1856.
- [35](#) Fixtures by Starr, Fellows and Company, ca. 1856.
- [36](#) Fixtures by Starr, Fellows and Company, ca. 1856.
- [37](#) Fixtures by Starr, Fellows and Company, ca. 1856.

- [38](#) Rod-hung chandelier, ca. 1856, similar to no. 78 on plate 37.
- [39](#) Fixtures by Fellows, Hoffman and Company, 1857-1859.
- [40](#) Fixtures by Fellows, Hoffman and Company, 1857-1859.
- [41](#) Fixtures from the 1856 Starr, Fellows and Company catalogue.
- [42](#) Fixtures from the 1856 Starr, Fellows and Company catalogue.
- [43](#) Fixtures from the Fellows, Hoffman and Company catalogue, 1857-1859.
- [44](#) Brass fittings from Starr, Fellows, and Company catalogue, 1856.
- [45](#) Brackets from the Archer, Warner, Miskey and Company catalogue, 1857-1859.
- [46](#) Archer and Warner Gothic chandelier.
- [47](#) Fixtures from the Archer, Warner, Miskey and Company catalogue, 1857-1859.
- [48](#) Fixtures from the Archer, Warner, Miskey and Company catalogue, 1857-1859.
- [49](#) Fixtures from the Archer, Warner, Miskey and Company catalogue, 1857-1859.
- [50](#) Fixtures from the Archer, Warner, Miskey and Company catalogue, 1857-1859.
- [51](#) Photograph of an interior with a ca. 1865 lamp and chandelier.
- [52](#) Monson's Patent Extension Fixture, 1860.
- [53](#) Cornelius and Baker chandelier in the Vermont Statehouse, 1859.
- [54](#) Cornelius and Baker chandelier in the U.S. Capitol, President's Room, ca. 1860.
- [55](#) Cornelius and Baker fixtures by J. G. Bruff for the Treasury Building, 1859.
- [56](#) Cornelius and Baker fixtures by J. G. Bruff for the Treasury Building, 1859.
- [57](#) Cornelius and Baker fixtures by J. G. Bruff for the Treasury Building, 1859.
- [58](#) Cornelius and Baker fixtures by J. G. Bruff for the Treasury Building, 1859.
- [59](#) Cornelius and Baker fixtures by J. G. Bruff for the Treasury Building, 1859.
- [60](#) Cornelius and Baker fixtures by J. G. Bruff for the Treasury Building, 1859.
- [61](#) Painting of a New York City saloon interior, 1863.
- [62](#) Music Room chandelier, Morse-Libby House, Portland, Maine, 1863.
- [63](#) Cornelius and Baker three branch cast-iron chandelier, 1860s.
- [64](#) Cornelius and Baker three branch cast-iron chandelier, 1860s.
- [65](#) Engraving of Tucker Manufacturing Company cast-iron chandeliers in the Paris Universal Exhibition, 1867.

- [66](#) Fixtures in A.T. Stewart's Mansion, New York City, 1869.
- [67](#) Fixtures in A.T. Stewart's Mansion, New York City, 1869.
- [68](#) Section through a mansion showing mechanism of a Springfield Gas Machine, ca. 1868.
- [69](#) Painting of W.H. Vanderbilt Parlor, New York City, 1873.
- [70](#) Chandeliers installed in the East Room of the White House, 1873.
- [71](#) Detail of a glass chandelier showing ball and socket joint at ceiling, ca. 1865.
- [72](#) Mt. Washington Glassworks Display in the Centennial Exhibition, Philadelphia, 1876.
- [73](#) Brass and ormolu chandelier by Mitchell, Vance and Company, 1870.
- [74](#) Cornelius and Sons display in the Centennial Exhibition, Philadelphia, 1876.
- [75](#) Fixtures by Cornelius and Sons, ca. 1876.
- [76](#) Fixtures by Cornelius and Sons, ca. 1876.
- [77](#) Fixtures by Cornelius and Sons, ca. 1876.
- [78](#) Fixtures by Cornelius and Sons, ca. 1876.
- [79](#) Fixtures by Cornelius and Sons, ca. 1876.
- [80](#) Fixtures by Cornelius and Sons, ca. 1876.
- [81](#) Fixtures by Archer and Pancoast Company, probably 1876.
- [82](#) Fixtures by Archer and Pancoast Company, probably 1876.
- [83](#) Fixtures by Archer and Pancoast Company, probably 1876.
- [84](#) Fixtures by Archer and Pancoast Company, probably 1876.
- [85](#) Fixtures by Archer and Pancoast Company, probably 1876.
- [86](#) Fixtures by Archer and Pancoast Company, probably 1876.
- [87](#) Yale classroom with reflector chandeliers.
- [88](#) A reconstruction of reflectors used at the Centennial Exhibition, Philadelphia, 1876.
- [89](#) Milwaukee Department Store Interior, ca. 1870.
- [90](#) Courtroom Fixtures, New York City, 1877.
- [91](#) Von Ezdorf design for chandelier, State, War and Navy Building, 1876-1886.
- [92](#) Fixtures by Thackera, Sons and Company, 1882.
- [93](#) Fixtures by Thackera, Sons and Company, 1882.

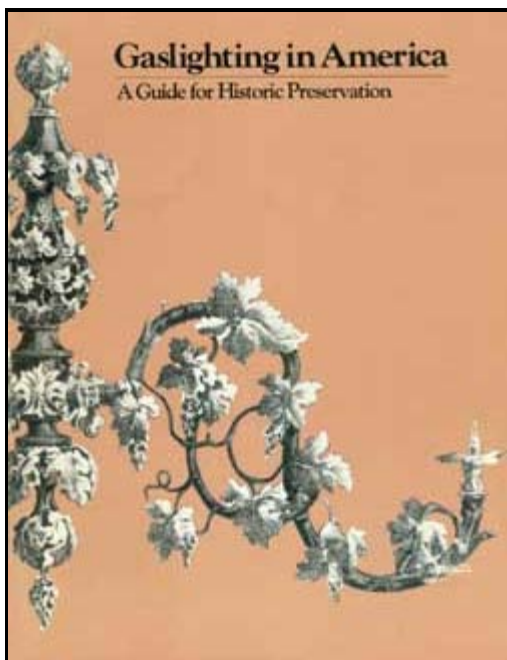
- [94](#) Chandelier by Thackera, Buck and Company, ca. 1881.
- [95](#) Fixtures by Thackera, Sons and Company, 1882.
- [96](#) Fixtures by Thackera, Sons and Company, 1882.
- [97](#) Fixtures by Thackera, Sons and Company, 1882.
- [98](#) Six-light glass ornamented chandelier, 1880s.
- [99](#) Welsbach burner, 1890.
- [100](#) Susan B. Anthony's parlor, ca. 1906.
- [101](#) 1880s chandelier with inverted gas burner and light controls, post 1905.
- [102](#) Fixtures from the McKenney and Waterbury Company catalogue, ca. 1900-1910.
- [103](#) Fixtures from the McKenney and Waterbury Company catalogue, ca. 1900-1910.
- [104](#) Fixtures from the McKenney and Waterbury Company catalogue, ca. 1900-1910.
- [105](#) Fixtures from the McKenney and Waterbury Company catalogue, ca. 1900-1910.
- [106](#) Gas fixtures from Sears, Roebuck and Company catalogue, 1908.
- [107](#) Combination gas and electric fixtures, 1892-ca. 1900.
- [108](#) Combination gas and electric fixtures, 1892-ca. 1900.
- [109](#) Combination gas and electric fixtures, 1892-ca. 1900.
- [110](#) Device for lighting the gas.
- [111](#) Lithograph of the People's Gas Company, Baltimore, 1870-1881.
- [112](#) Ornamented gasmeter, ca. 1867.
- [113](#) Washington, D.C., street lamp, 1865.
- [114](#) Philadelphia theater street lamps, 1860.
- [115](#) Reconstruction of Ford's Theater street lamp.
- [116](#) Lamppost for private driveway, ca. 1850.
- [117](#) Welsbach burner street lamps in Independence Square, Philadelphia, 1905.
- [118](#) Cast-iron ornamental lamp standards at Tennessee State Capitol, 1859.
- [119](#) Cast-iron exterior lamp brackets, probably 1854.

myers/contents.htm
Last Updated: 30-Nov-2007

NATIONAL PARK SERVICE

Gaslighting in America

A Guide for Historic Preservation



GASLIGHTING IN AMERICA

A Guide for Historic Preservation

By
Denys Peter Myers

1978

©1978 Denys Peter Myers

U.S. Department of the Interior
Heritage Conservation and Recreation Service
Office of Archeology and Historic Preservation
Technical Preservation Services Division
Washington, D.C.

TABLE OF CONTENTS

[myers/index.htm](http://www.nps.gov/history/history/online_books/hcrs/myers/index.htm)
Last Updated: 30-Nov-2007

NATIONAL PARK SERVICE

Gaslighting in America A Guide for Historic Preservation



FOREWORD

Under Executive Order 11593 signed May 13, 1971, the Secretary of the Interior was given the responsibility for developing and disseminating "to Federal agencies and State and local governments information concerning professional methods and techniques for preserving, improving, restoring and maintaining historic properties." To meet the Secretary's responsibilities, the Technical Preservation Services Division, Office of Archeology and Historic Preservation, Heritage Conservation and Recreation Service, is preparing a series of publications on the technical aspects of historic preservation for use by administrators, architects, and others at the Federal, State, and local levels involved with the preservation and maintenance of cultural resources.

This preliminary report "Gaslighting in America: A Guide for Historic Preservation" was prepared under contract by Denys Peter Myers, Architectural Historian, Alexandria, Virginia. Three staff members made substantial contributions toward the publication of this report as part of the Preservation Handbook series: Carole L. Perrault, Architectural Historian, and Elizabeth Temkin, Summer Intern, who assisted in creating the initial subject outline and compiling the illustrations; and Sarah M. Sweetser, Architectural Historian, who edited and worked with the author to develop the manuscript into its present published form. The final draft was edited by Betty J. Berry, Writer/Editor, National Register Division.

Comments and suggestions regarding additions or changes prior to final publication are encouraged and should be sent to Lee H. Nelson, A.I.A., Preservation Handbook Editor, Technical Preservation Services Division, Office of Archeology and Historic Preservation, Heritage Conservation and Recreation Service, U.S. Department of the Interior, Washington, D.C. 20240.

W. Brown Morton III
Departmental Consultant for Historic Architecture
Chief, Technical Preservation Services
Division

[<<< Previous](#)

[<<< Contents >>>](#)

[Next >>>](#)

NATIONAL PARK SERVICE

Gaslighting in America
A Guide for Historic Preservation



ACKNOWLEDGEMENTS

It is a pleasure to thank the many people without whose kind assistance the writing of this paper would have been onerous indeed. John C. Poppeliers, Chief of the Historic American Buildings Survey, graciously acceded to requests for specially taken photographs, and Jack E. Boucher, HABS Photographer, devoted much overtime and skill to supplying illustrative material. Henry A. Judd, Chief Historical Architect, National Park Service, kindly supplied data on Ford's Theater.

James M. Goode, Curator of the Smithsonian Building, was exceedingly generous both with his time and with photographs of gas fixtures in the collection under his care, none of which had been previously photographed. My thanks go to him and Rodris Roth, Curator, Division of Costumes and Furnishings at the Smithsonian, for their thoughtful review of the manuscript. Donald J. Lehman supplied much information on pertinent material in the National Archives and on the artist-designer Richard von Ezzdorf. William Seale lent a number of particularly informative photographs from his extensive collection of interior views. Keir Helberg spent a day showing his restored gaslighting in Baltimore and discussing the fine points of various types of burners. Craig Littlewood offered useful data on early manufactures.

Suzanne Boorsch of The Metropolitan Museum of Art's Print Room, Etta Falkner, Librarian of Old Sturbridge Village, Edith Nisbet, Librarian of the American Gas Association, Arlington, Virginia, and Wendy Shadwell of the New York Historical Society were helpful well beyond the call of duty. David Sellin, Curator of the U.S. Capitol, and Florian H. Thayne in the Architect of the Capitol's office assisted materially with research of obscure questions regarding the correspondence of the two Philadelphia firms of Cornelius and Baker and Archer and Warner relating to the Capitol.

Mary Ison and C. Ford Peatross of the Prints and Photographs Division of the Library of Congress were helpful and took a personal interest in the research. Stanley Brown, Douglas Helms, and Michael Musack of the National Archives were also most generous with assistance of more than a routine kind. The Bernard Fensterwalds of Alexandria, Virginia, allowed photographs to be taken of one of their chandeliers. Last, but certainly not least, thanks are due an Alexandria resident who allowed her gaslighted chandelier to be photographed but who wishes to remain anonymous. In the course of a prolonged research project, it is almost inevitable that some who helped are overlooked. To them go both thanks and an apology for the omission of their names. It is also almost inevitable in a pioneering research effort that factual errors occur. For whatever errors may have crept in, the author alone is responsible.

[<<< Previous](#)

[<<< Contents >>>](#)

[Next >>>](#)

myers/ack.htm
Last Updated: 30-Nov-2007

NATIONAL PARK SERVICE

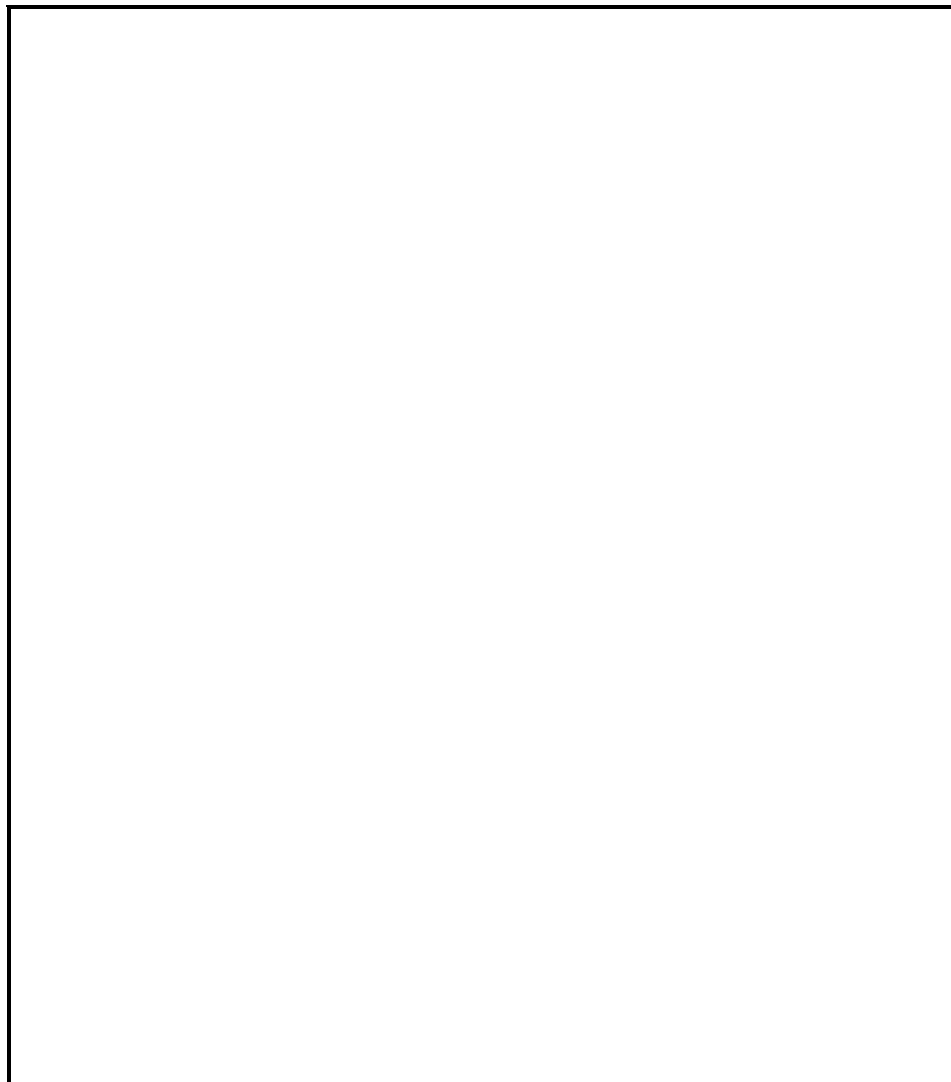
Gaslighting in America A Guide for Historic Preservation



INTRODUCTION

This report focuses on the types and styles of gas fixtures which appeared in the rooms and on the streets of 19th and early 20th century America. It does not describe the scientific methodology for the manufacture of gas, nor the technology of pipe installation.

A chronological approach has been adopted in the hope that the text and illustrations may serve as guides for avoiding anachronisms in preservation projects, as well as exemplifying the types of installation appropriate to specific situations. To this end, we have included many kinds of fixtures known to have been used to a considerable extent in public or private buildings and streets, ranging from the simple iron "T" to the elaborate crystal chandelier. Certain devices that were seldom used in America (if the contemporary pictorial evidence is a reliable guide) have not been discussed or illustrated. The emphasis has been on the norm, not the exceptions to almost universal practice.





Frontispiece—View of Boston and Sandwich Glass Company Exhibit, 1878.

Overall, American gas fixtures ranged from the lavishly elegant to the starkly plain. This half of a stereograph shows the Boston and Sandwich Glass Company's display at the annual exhibition in Mechanics' Hall, Boston, 1878. It illustrates not only typical American glass chandeliers and wall brackets (commonly miscalled "crystal") among the most elaborate gas fixtures of the period, but also at the upper right a fixture of the simplest form, an iron pipe gas "T."

This strictly utilitarian "T" (which was not part of the exhibit) has six burners; the more typical examples had only two. Also illustrated on the glass chandeliers are the then recently introduced wide-necked glass shades on slender wire supports called "spiders," and the hanging triangular notched spear prisms that first appeared around 1850.

Courtesy of the Sandwich Historical Society, Sandwich, Massachusetts.

Background

As with most scientific discoveries, no individual can be credited with the "invention" of

gaslighting. As early as 1739 in London, John Clayton (1693-1773) reported the results of his "Experiment Concerning the Spirit of Coals" in the *Philosophical Transactions* published by the Royal Society. Clayton successfully distilled gas from burning coal but made no economically practical application of his discovery. During the rest of the 18th century, various experimenters demonstrated gaslighting on a limited scale without significant results.

At the turn of the 19th century, another Britisher, William Murdock (1754-1839), raised gaslighting from the status of a curiosity to a practical alternative to candles and lamps. He accomplished this feat by distributing coal gas by pipes to light the Boulton and Watt Soho Works at Birmingham in 1798 and the Phillips and Lee factory at Salford in 1805. Perhaps even more significant than the success of the apparatus was the fact that the Salford factory was lighted by gas for a cost of £600 compared to £2,000 a year for candles. In 1808, the British scientific community recognized Murdock's achievement by awarding him the Royal Society's Rumford Medal "for a treatise on his application of the illuminating properties of carburated hydrogen [coal gas] for the purpose of furnishing a new and economical light."

In the meantime, the French inventor Philippe Lebon (1767-1804) was granted a patent by the First Consul Bonaparte in 1803 for distilling illuminating gas from wood. Lebon's work attracted the attention of an enterprising and persistent German entrepreneur named Friedrich Albrecht Winzer (1763-1830), who acquired the Lebon patent. In 1804 Winzer traveled to England, where he Anglicized his name to Frederick Albert Winsor. He abandoned the use of wood gas for coal gas and set about organizing a company for the manufacture and distribution of the new illuminant. Winsor lighted an extensive segment of Pall Mall in London by gaslamps on June 4, 1805. He had business organizing abilities that Murdock lacked, and in spite of the latter's opposition, Winsor obtained a charter in 1812 from Parliament for the first gaslight company — The London and Westminster Chartered Gas Light and Coke Company. Thereafter, with the invaluable aid of a notable engineer named Samuel Clegg (1781-1861) and others, the company flourished.

Gaslighting spread sporadically to other urban centers and then to smaller communities. It spread more rapidly in Great Britain and in the United States than on the European continent, but it eventually became the predominant 19th century illuminant in heavily settled areas throughout what was then called the "civilized" world. In the last two decades of the century, gaslighting was challenged by electric lighting, but gas remained popular for street lighting until the outbreak of the First World War in 1914. Specific data on the growth and chronology of American gas companies by geographic location are given in the text and notes accompanying plate 111 and in the Appendix of this report.

Gaslighting Fixtures

The following illustrations and commentary cannot, of course, answer every question that may arise, but it is hoped that at least the main outlines of American gaslighting practice have been clearly drawn. To give an example of how modern concepts can subtly influence decisions erroneously, it was recently considered most appropriate to hang a crystal gas chandelier in the dining room of a *circa* 1860 house. Contemporary evidence indicates, however, that crystal, or glass fixtures were almost never used in dining rooms, although they occurred with some frequency in parlors. Another instance of misunderstanding, in a restoration purporting to represent the 1860s, was the use of gas mantles which were not developed until the late 1880s. This report provides guidelines to prevent anachronisms and the misapplication of styles of fixtures, their burners and finishes.

In researching gas fixtures, it is important to examine actual fixtures, as well as illustrative material of the period. First-hand examination of the lighting devices in this manner by the restoration artisan improves the quality of the restoration, and prevents two major errors.

First is the misinterpretation of scale from either a distorted photograph, or an inaccurately drawn sketch. Second, is the failure to reproduce the correct finish on the metal and glass components of the fixture. Old lithographs, engravings, and photographs rarely suggest the correct color or finish. Only a careful examination of original fixtures that have not been improperly refinished, can serve as a true guide. The precise colors and shadings of brass, ormolu, "bronze" finishes, frosted glass, and so on, can best be achieved by carefully copying fixtures of the period to be represented. Finally, it should be remembered that it is preferable to use original fixtures rather than reproductions, provided that the suitable fixtures can be found.

Exterior lighting has its own history and restoration problems. Because of numerous exterior photographs and streetscapes available from the 1860s to the present, determining appropriate style is generally not difficult. Stylistic changes did not occur as frequently with exterior lighting; in many areas the same lampposts remained despite modernizing improvements to the lantern. However, reference to pictorial evidence from the same general location, time period, type of building or street scene is important. Furnishing the gas for exterior lighting involves many of the same problems as for interior fixtures, such as complying with municipal codes.

Was Gaslighting Used?

Before making any selection of gas fixtures, physical or documentary evidence must be present to indicate that gaslighting was used in the building or street under consideration. Capped gas butts in areas such as back corridors, attics, cellars, or butler's pantries may provide visible evidence. If no visible evidence exists, gas pipes within walls can supply convincing evidence, provided that they can be shown not to have serviced heating or cooking appliances rather than lighting fixtures. Because gas pipes were run within the walls and did not show, it is highly improbable that they were ever entirely removed when electric lighting was installed in a formerly gaslighted building. Therefore, if there is no physical trace of gaslight system within a structure, any documentary evidence seemingly to the contrary should be interpreted with the greatest caution. Having established by physical evidence or by a combination of physical and documentary evidence that the structure was once gaslighted, it could be ascertained by research in local archives whether the gas was supplied from a gas company or from a private gas machine.

Connecting the Gas

The use of gas is rarely a concern for preservationists, having been precluded by its scarcity, the increased restrictions of state and local building codes and, more recently, by the national concern for conservation of fossil fuels. For the few cases where gas lines and service are still intact, the following factors should be taken into account.

The gas now available is not the manufactured coal gas used almost universally in the past. It is natural gas, which burns with a more intense heat than coal gas. Beyond that, there are certain dangers to be considered. Coal gas leaks were easily detectable by smell, whereas natural gas requires the use of an additive to give it a discernible odor. It was recently found that natural gas leaking into the fill near a foundation loses its warning odor and can travel along buried pipe into the cellar with explosive results. Under no circumstances should plastic pipe be used, because it has a tendency to split, permitting the undetected escape of gas. All pipe must be metal, and the completed piping installation must undergo stringent testing for leaks, as set forth in Gerhard's *American Practice of Gas Piping* (see Bibliography). Repairing existing pipe will require cutting into walls, floors and ceilings.

Where an ornamental plaster medallion indicates the previous existence of a ceiling fixture,

the restored fixture should be piped by raising portions of the flooring above, and laying the pipe between the joists. In a few instances, the upper flooring will be ornamental (i.e. parquet) and should not be disturbed, in which case, careful "excavation" of the plaster ceiling may be necessary. Chandeliers should be supported by iron brackets secured to adjacent ceiling joists and not supported by pipe alone. It is also desirable to support all but the lightest wall brackets by iron braces secured to adjoining wall studs or by utilizing expansion joints in masonry mortar joints.

Electrification

However, when it is not feasible to reinstall gas piping, electric light can be regulated with the use of low voltage transformers or silicon controlled rectifier "dimmers" to simulate the quality of gaslight. Despite the fact that electricity cannot convincingly imitate open flame lighting, which flickers occasionally, the color and level of light can be achieved.

Until the introduction of the incandescent gas mantle, or Welsbach burner (*circa* 1890), gas burners gave relatively little light. The average flat flame burner, whether of the fishtail (union jet) or batwing type, did not deliver a maximum of over 16 candlepower under optimum conditions. Even the Argand burner, which was little used in America except for the center burners of slide fixtures (see plates 83, 84, and 95) and for some "portables," or lamps, gave only a slightly greater amount of light. Therefore, if electrical simulation of gaslighting is decided upon, dimmers or transformers should be provided. Candle socket bulbs should be used as the larger diameter of standard sockets destroys the desired illusion of gas burnertips. Candle sockets are actually larger than gas tips as well, but their size is more sympathetic in diameter to the real burners. The plastic sleeves with which electric candle fixtures are supplied should be painted dark gun metal grey, unless the fixtures originally had gas burners designed to imitate candles (shown in plate 15). The bulbs used to imitate flat flame jets should not exceed ten or fifteen watts at the most. A ten-watt glass flame bulb emits the amount of light needed to simulate a lighted fishtail burner. There are also bulbs available commercially that imitate gas mantles satisfactorily. It is difficult, dazzled as we are by the intensity of modern lighting, to realize how comparatively little light satisfied our forebears, but it is as important to restore the correct color and level of light as it is to restore the fixture.

The history of gaslighting styles provides an interesting and sometimes amusing commentary on the needs and decorative aspirations of our 19th century citizenry. Some of the fixtures pictured herein were unique, others were commonplace to everyday life. Understanding the scope of the devices available, their typical uses, and their appropriateness to the historic needs of the project at hand will complement the numerous efforts required for the preservation of the fabric and character of historic structures today.

<<< [Previous](#)

<<< [Contents](#) >>>

[Next](#) >>>

NATIONAL PARK SERVICE

Gaslighting in America
A Guide for Historic Preservation



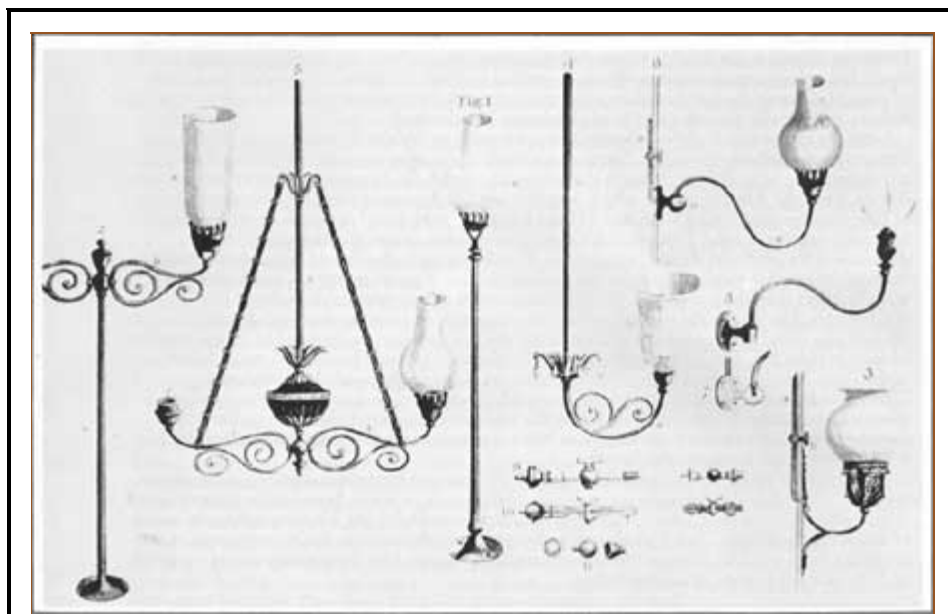
PLATES

Various fixtures in Accum's treatise on gaslighting, London, 1815. Plate 1

No record of gas fixtures made in the United States before the late 1830s has been found. Until ca. 1840, it appears that gas fixtures used in America were imported from England and, to some extent, France.

The earliest illustrations of gas fixtures are probably those published in 1815 by Rudolph Ackermann, the London art dealer and publisher of books and prints, as embellishments of Fredrick Accum's *Practical Treatise on Gas-Light*. Represented here are fixtures "already in use in this Metropolis." [1] From left to right, they are described as 2) "Rod Gas Lamp with branches," 5) "Pendent Double-Bracket Lamp," 1) "Rod Lamp," 4) "Pendent Rod Lamp," 6) "Swing Bracket Lamp," 3) "Bracket Lamp." Except for figure 8 (right center), a "Swing Cockspur Lamp," the burners shown appear to be of the Argand type. It is worth noting that the terms "bracket" and "pendent" persisted in use, although "rod" types were soon referred to as "pillar."

Also around 1815, Ackermann published an aquatint by J. Bluck after a watercolor by Augustus Pugin (not reproduced here) showing possibly the earliest view of a gaslighted interior, Ackermann's Art Library. [2]



Reprinted from Fredrick Accum, *A Practical Treatise on Gas-Light*, London, 1815, Plate 3, courtesy of American Gas Association, Inc. Library, Arlington, Virginia.
([click on image for a PDF version](#))

Ornamental fixtures in Accum's treatise on gaslighting, London, 1815.

Plate 2

It is sometimes fallaciously thought that early gas fixtures were simple, even primitive, in form and that ornamental fixtures are therefore comparatively late in date. This plate from Accum's *Practical Treatise on Gas-Light* of 1815 clearly proves otherwise. "The gas-lamps exhibited in this plate, are employed in the library, counting-house, warehouse, and offices of Mr. Ackermann. [3] On this plate, figures 1 through 8 are described respectively as "a Candelabrum, an Arabesque Chandelier, a Roman Chandelier, a Gothic Chandelier, a Pedestal Figure Lamp, a Pedestal Vase Lamp, a Girandole, and a Candelabrum." Observe that as early as 1815, the eclectic taste so characteristic of the 19th century already embraced "Arabesque, Roman, and Gothic" designs. With the exception of the cockspur at the top of figure 1, all the burners are of the early type termed "rat-tail" (see plate 3). These fixtures were finished in greenish-bronze and highlighted with gilding.

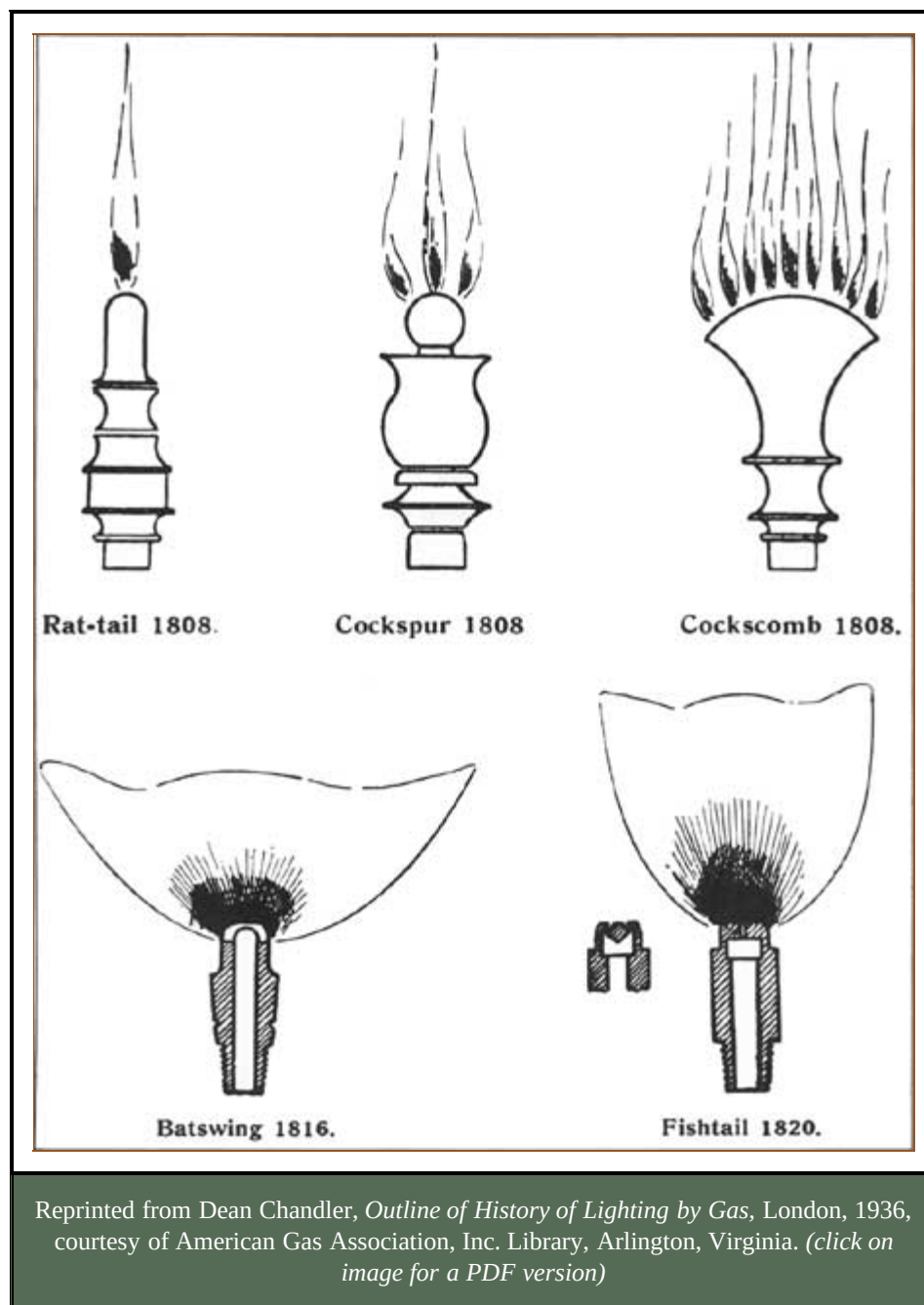


Gas burner types developed by 1820.

Plate 3

Five of the six types of burners in use by ca. 1820 are shown here, the sixth in plate 4. The cockspur and the cockscomb were wasteful and inefficient and soon fell into disuse. The rat-tail continued in use primarily in a modified form designed for burners imitating candles. The batwing burner, used for street lamps and other outdoor illumination, and the fishtail burner were, except for gas candles, the almost universally used forms of burners until the introduction of the Welsbach mantle for general use in 1890. [4] The batwing burner had a domical top pierced by a narrow slit across it. The fishtail, or union jet, burner was apparently invented by the Scotsmen James Neilson and James Milne. [5] It was so designed that two jets of equal size impinged on each other to produce a flat flame issuing from a single small aperture. The tops of fishtail burners were usually slightly concave and were pierced by a small central hole.

Very short lengths of pipe with either fishtail, batwing, or rat-tail burners were termed "scotch tips."



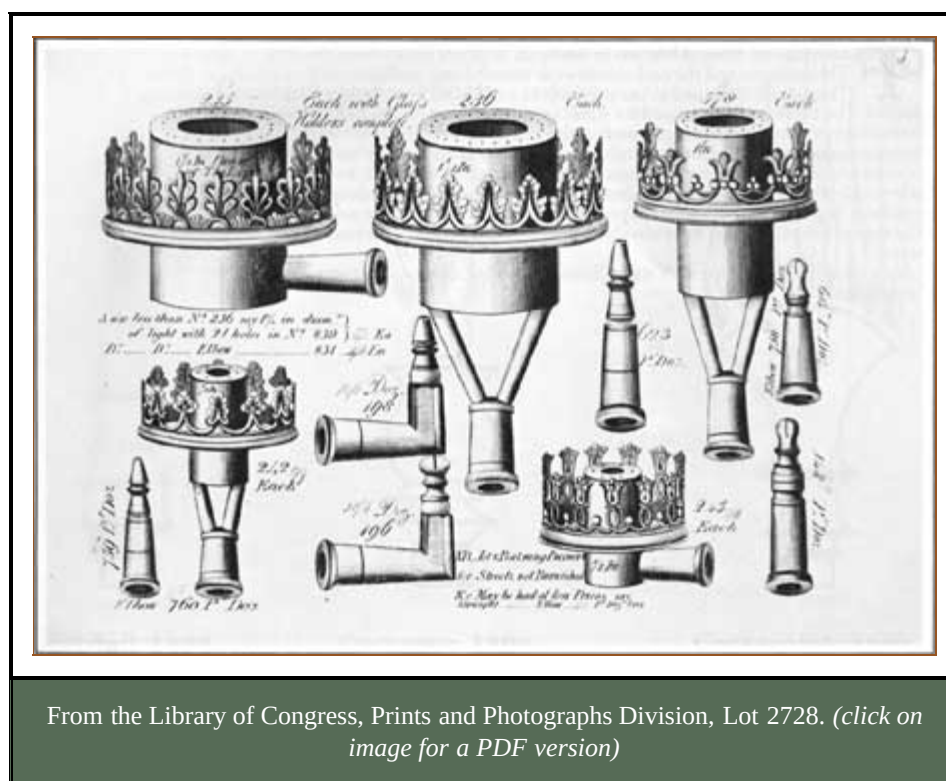
Burners from unidentified English catalogue, ca. 1820-1830.

Plate 4

This illustration and the following eight plates are from a series of 69 unidentified British engravings of lighting fixtures dating around 1820-1830. [6] The burners with the ornamental galleries, multiple holes, and hollow centers operated on the Argand principle, producing a circular column of flame with air at the center and around the periphery. The Argand gas burner, the sixth type in use early in the development of gaslighting, does not appear to have been used extensively in the United States, although it was popular in England for interior illumination as late as the 1840s. It required the use of a glass chimney, whose drawbacks

were frequent breakage and the constant need for cleaning. The crown-like galleries shown here were supports for these chimneys.

The burners with the slitted tops are batwing; those with the single holes, here termed "jet" burners, are probably fishtail, or union jet burners. Early burners, whether of iron or brass, frequently clogged because of corrosive impurities in the gas. Suppliers furnished small augers, narrow slips of brass, and small saws to clear burners. After the introduction of the steatite, or "lava," burner tip in 1858, clogging became less of a problem. These noncorroding tips, invented by M. Schwarz of Nuremburg, were made of a variety of Bavarian soapstone which had been subjected to slowly increased heat and subsequent boiling in oil. Schwarz was granted an American patent on July 20, 1858. [7]

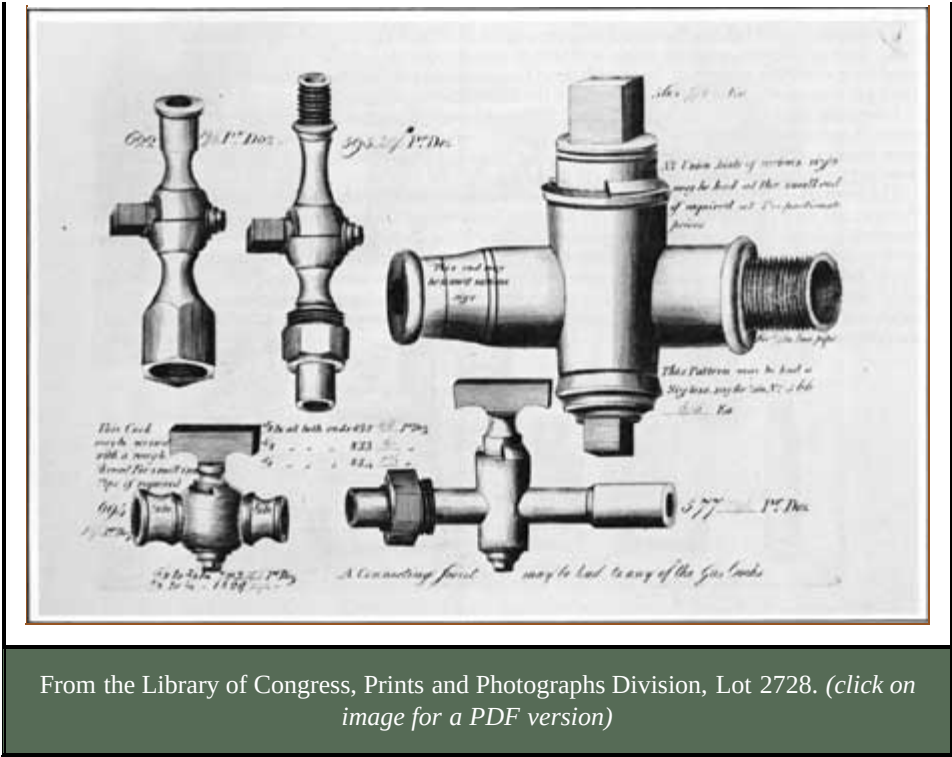


Gas cocks from unidentified English catalogue, ca. 1820-1830.

Plate 5

This plate from the before-mentioned series of unidentified British engravings shows clearly the pin and partial collar safety device which prevented the gas cocks from being turned too far and unintentionally left on. After it was discovered that the pins provided insufficient security against accidental breakage and consequent asphyxiation, threaded cocks that precluded all possibility of leakage were frequently used.



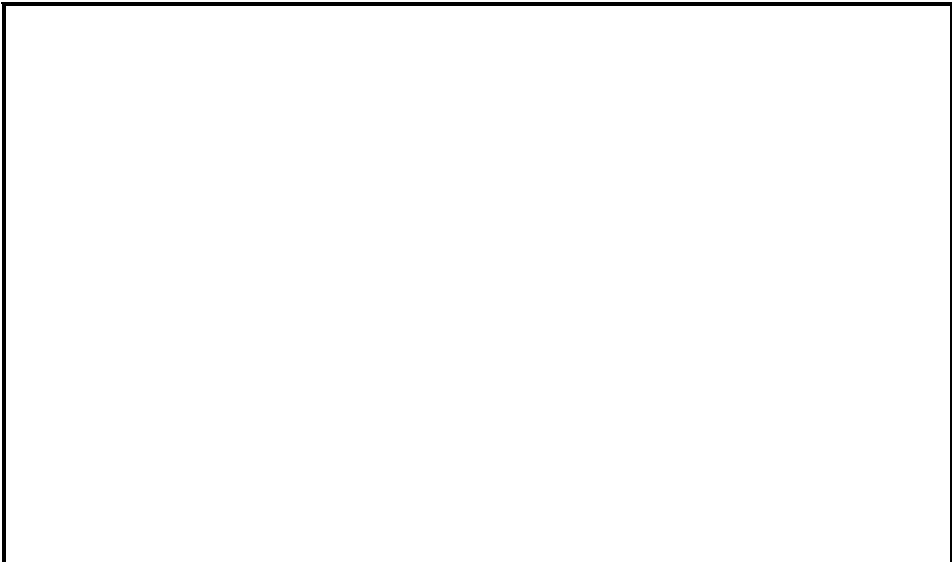


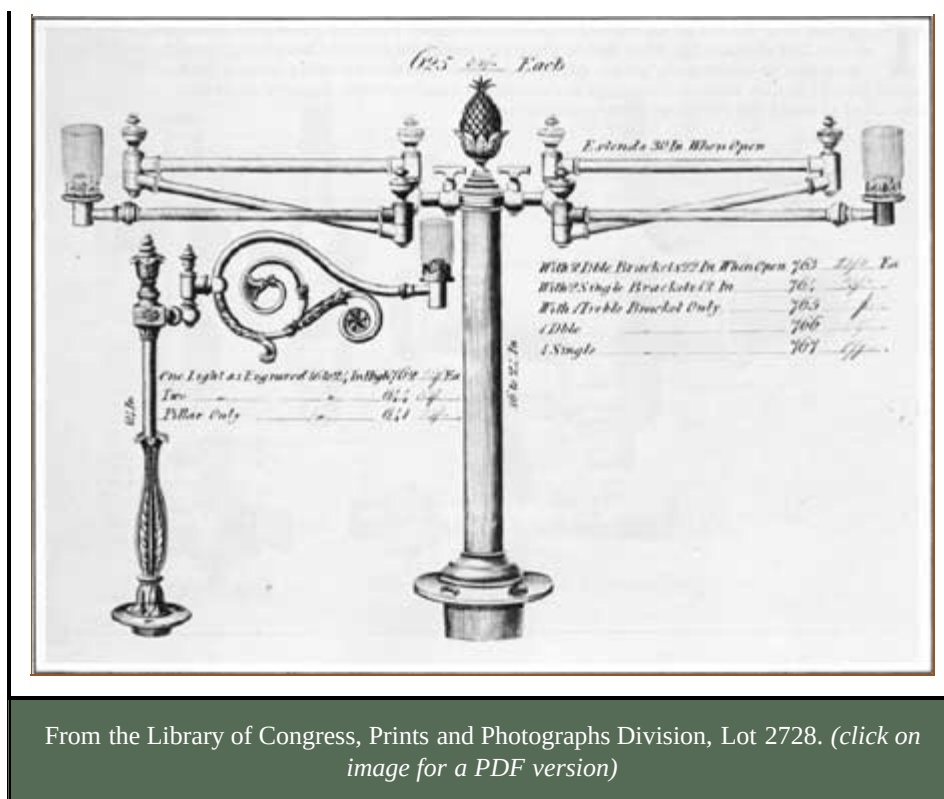
From the Library of Congress, Prints and Photographs Division, Lot 2728. (click on image for a PDF version)

"Pillars" from unidentified English catalogue, ca. 1820-1830. Plate 6

This plate shows that so-called "pillar" fixtures and, more significantly, jointed branches were already in use during the 1820s. Jointed branches continued in use until the end of the gas era, particularly in bedroom fixtures. Their flexibility was particularly advantageous where light was desired in close proximity to mirrors. Jointed branches were also used near desks, or wherever light was needed for close work.

Most of the burners shown in the unidentified British engravings dating from ca. 1820-1830 are of the Argand type, and have the characteristic straight, tubular chimneys necessary for the Argand burner, but do not have shades. A manuscript page preceding the series notes that "articles may be had bronzed to order at the same price as lacquered," indicating that the principal finish was probably burnished brass, which required lacquer to prevent tarnishing.

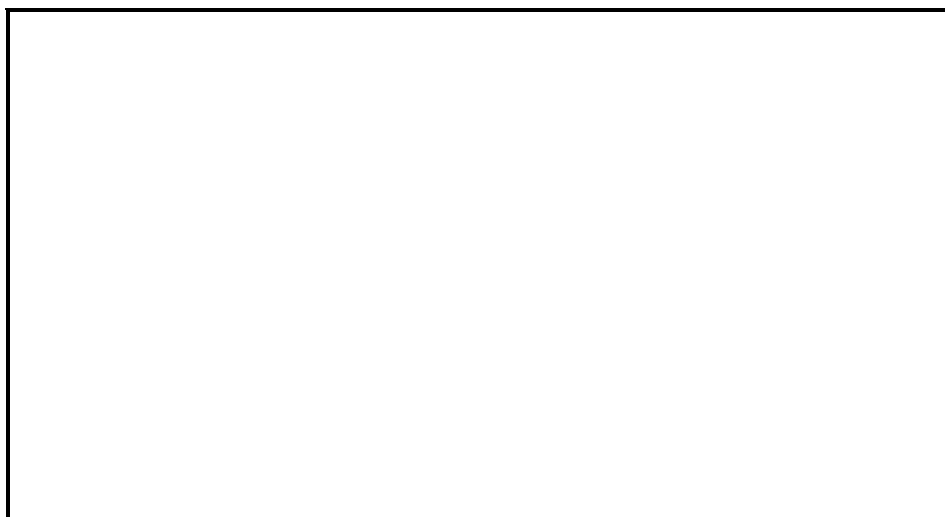


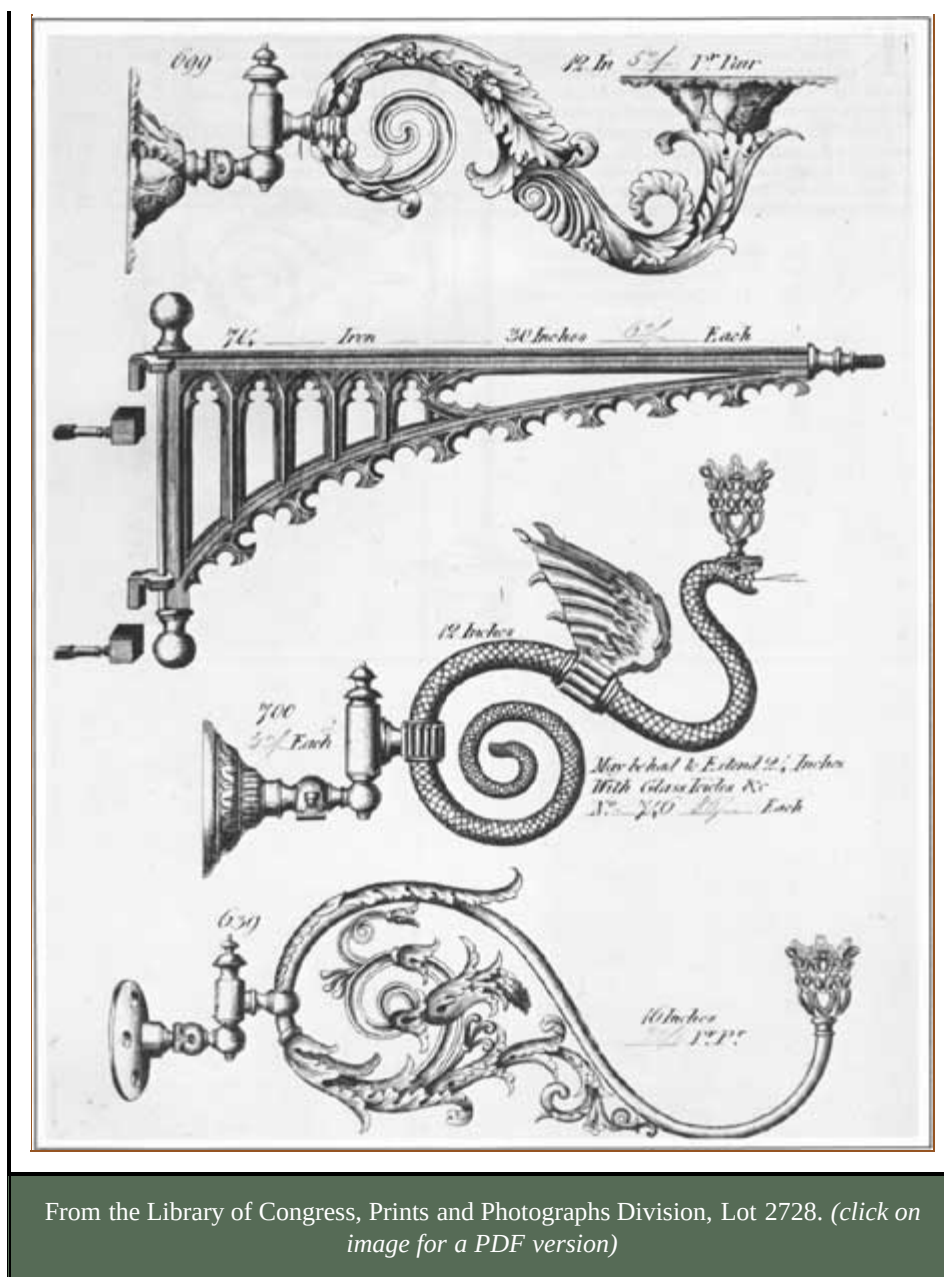


Brackets from unidentified English catalogue, ca. 1820-1830.

Plate 7

These wall brackets, like the chandeliers illustrated on plate 2, show both the elaborateness of early gas fixtures and the eclectic stylistic character of their design. The uppermost bracket had traces of Baroque influence, although the foliate motifs were neoclassical in manner. The second bracket was based on architectural elements of the Gothic style rather than on any actual medieval prototype. Note that this fixture was iron and was probably gilded, whereas the other branches were probably brass. The serpentine bracket was typical of Regency taste in its least classical and most fanciful manifestation. Fantastic winged creatures appeared as late as 1856 in an American catalogue on bracket branches, and a bracket was designed in the form of a rattlesnake as late as 1859. [B] The foliate bracket at the bottom of the plate was thoroughly Greek Revival in the anthemion (honeysuckle) motif. The ball joints of all these brackets indicate that they were designed to swing from side to side.



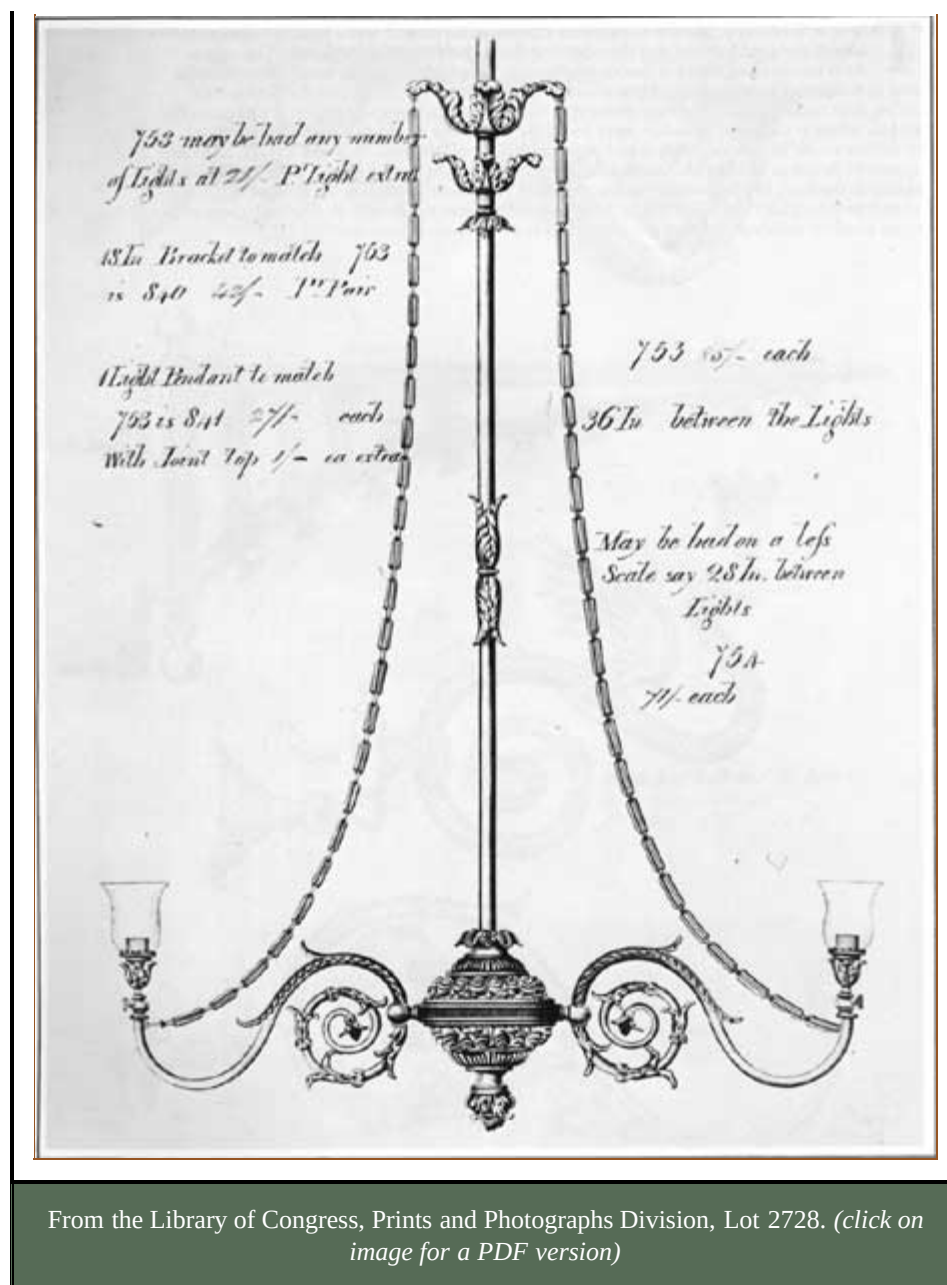


"Pendant gaselier" from unidentified English catalogue, ca. 1820-1830.

**Plate
8**

The term "pendant" used in the text of this plate was, by the 1840s, applied only to fixtures having one or two lights. "Chandelier" or "gaselier" (also spelled "gasolier" or "gasalier") were used interchangeably for fixtures having three or more lights until the 1860s, when "chandelier" ultimately prevailed in common usage.

The slack chains of the pendant shown here were ornamental, not functional. Such chains were frequently used to decorate gas fixtures until the mid-1850s and were characteristic of gaselier design until about 1850. This 1820s example is severely neoclassical in design compared with fixtures of the late 1840s and 1850s. Note that more branches could be added and that the span of 36 inches could be reduced to about 28 inches.



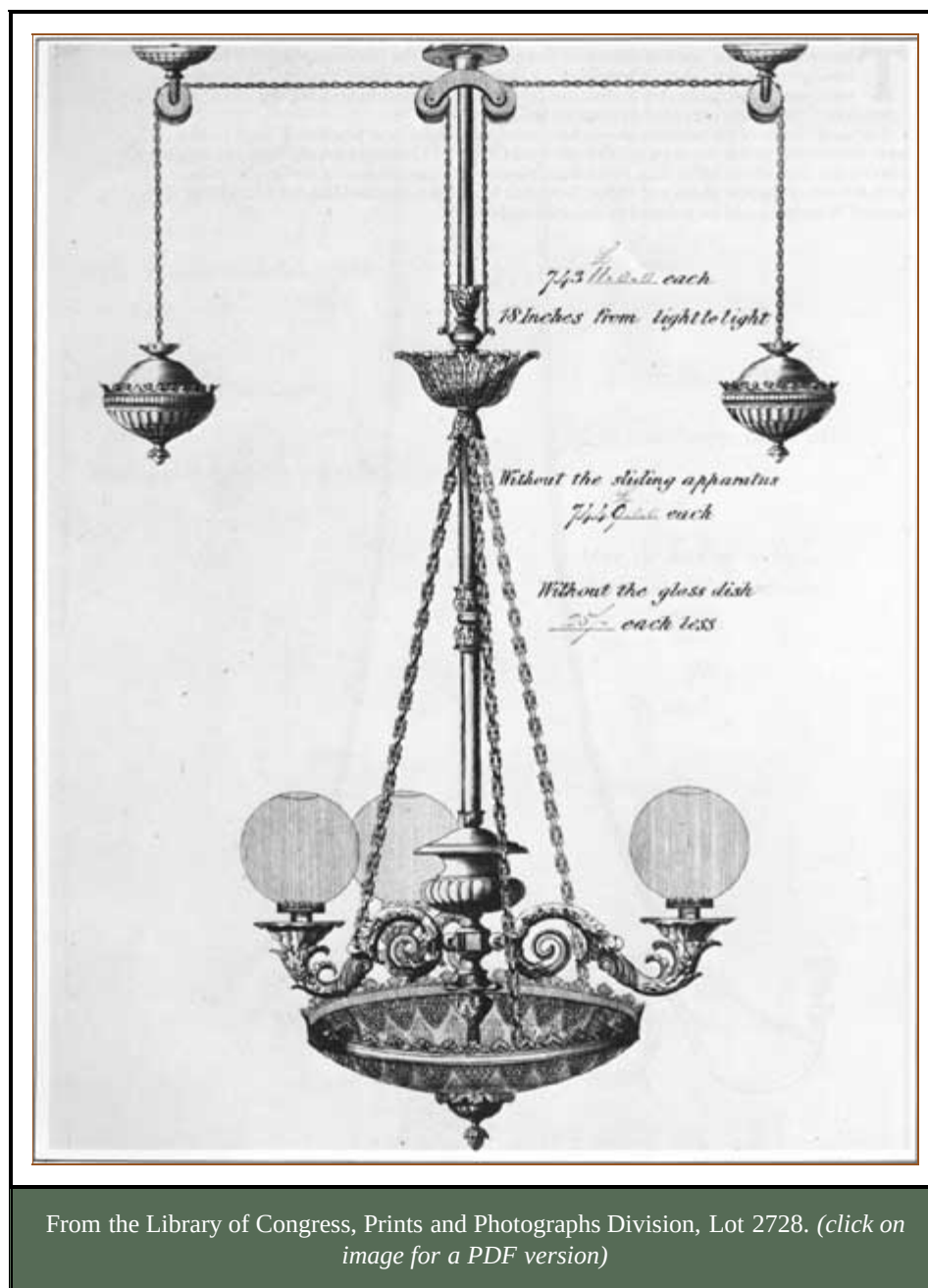
Water seal gaselier from unidentified English catalogue, ca. 1820-1830.

**Plate
9**

This plate provides evidence that water-seal gaselier which could be raised or lowered, were available as early as the 1820s. Gas had several advantages over oil lamps and candles, among them greater safety from fire, less smoke, and no grease or oil spills. But it had one real disadvantage—lack of portability. To overcome that disadvantage, numerous ingenious devices were designed such as the jointed extensible branches depicted on plate 6; and here the water seal at the top of the outer sliding stem permitted the raising or lowering of a gaselier without danger of gas leakage. A film of oil prevented rapid evaporation of the water.

In later examples, the counterweights were suspended from pulleys attached directly to the outer stem, omitting the extra set of pulleys fastened to the ceiling as shown in this plate.

Movable suspension chandeliers such as this were frequently used where light was desired close to a table. Hence, they were often used in dining rooms or over library or parlor center tables. However, there was no strict rule regarding their use. There is at least one documented instance of the use of chandeliers over the aisle, where there were no tables, between the bar and the dining booths in a St. Louis oyster saloon. [9]



<<< [Previous](#)

<<< [Contents](#) >>>

[Next](#) >>>

NATIONAL PARK SERVICE

Gaslighting in America A Guide for Historic Preservation



APPENDIX

This chronological listing is based upon the alphabetical listing compiled by John B. Murray, a New York dealer in gaslight shares and published in *The American Gas-Light Journal*, June 15, 1863, pp. 370-373. The dates given are the years when the gas companies received their charters from their respective state legislatures. Some companies began operations *before* their charters were formally approved; others did not begin operations until a year or more *after* their charters were granted.

- 1817 Baltimore, Maryland
- 1822 Boston, Massachusetts
- 1823 New York, New York
- 1825 Brooklyn, New York
- 1830 Manhattan (New York City), New York
- 1833 Evansville, Indiana
- 1835 New Orleans, Louisiana
- Pittsburgh, Pennsylvania
- 1836 Monroe, Michigan
- 1838 Louisville, Kentucky
- 1839 St. Louis, Missouri
- 1841 Cincinnati, Ohio
- 1844 Philadelphia, Pennsylvania
- 1845 Albany, New York
- 1846 Charleston, South Carolina
- Cleveland, Ohio
- Newark, New Jersey
- 1847 Fall River, Massachusetts
- Milwaukee, Wisconsin
- New Haven, Connecticut
- Paterson, New Jersey
- Trenton, New Jersey
- 1848 Buffalo, New York
- Dayton, Ohio
- Providence, Rhode Island
- Reading, Pennsylvania
- Springfield, Massachusetts
- Syracuse, New York
- Troy, New York
- Washington, Pennsylvania
- Zanesville, Ohio
- 1849 Chicago, Illinois

- Detroit, Michigan
- Great Falls, New Hampshire
- Hartford, Connecticut
- Lancaster, Pennsylvania
- Lawrence, Massachusetts
- Lowell, Massachusetts
- Portland, Maine
- Savannah, Georgia
- Utica, New York
- Worcester, Massachusetts
- York, Pennsylvania
- 1850 Columbus, Ohio
- Easton, Pennsylvania
- Nashville, Tennessee
- Pawtucket, Rhode Island
- Salem, Massachusetts
- Wheeling, Virginia (West Virginia)
- Williamsburg, New York
- Yreka, California
- 1851 Alexandria, Virginia
- Augusta, Georgia
- Bridgeport, Connecticut
- Charlestown, Massachusetts
- Chelsea, Massachusetts
- Chillicothe, Ohio
- Frankfort, Kentucky
- Frederick City, Maryland
- Germantown, Pennsylvania
- Madison, Indiana
- Portsmouth, New Hampshire
- Richmond, Virginia
- Schenectady, New York
- 1852 Allegheny, Pennsylvania
- Bangor, Maine
- Burlington, New Jersey
- Cambridge, Massachusetts
- Camden, New Jersey
- Columbia, Pennsylvania
- Columbia, South Carolina
- Elmira, New York
- Erie, Pennsylvania
- Ithaca, New York
- Lewiston, Maine
- Lynchburg, Virginia
- Lynn, Massachusetts
- Macon, Georgia
- Manayunk, Pennsylvania
- Manchester, New Hampshire
- Memphis, Tennessee
- Mobile, Alabama
- Montgomery, Alabama
- Nashua, New Hampshire
- New Albany, Indiana

New Bedford, Massachusetts
Newburg, New York
Newburyport, Massachusetts
Oswego, New York
Petersburg, Virginia
Rochester, New York
Rome, New York
San Francisco, California
Waterford, New York
Watertown, New York
West Chester, Pennsylvania
Wilmington, Delaware

1853 Allentown, Pennsylvania
Augusta and Hallowell, Maine
Bath, Maine
Binghamton, New York
Bordentown, New Jersey
Brookline, Massachusetts
Burlington, Vermont
Canandaigua, New York
Cape Island, New Jersey
Columbus, Georgia
Concord, New Hampshire
Covington and Newport, Kentucky
Dedham, Massachusetts
East Boston, Massachusetts
Fitchburg, Massachusetts
Geneva, New York
Greenpoint, New York
Haverhill, Massachusetts
Hudson, New York
Jamaica Plain, Massachusetts
Jersey City, New Jersey
Lexington, Kentucky
Little Falls, New York
Middletown, Connecticut
New London, Connecticut
Newport, Rhode Island
Norristown, Pennsylvania
Plymouth, Massachusetts
Quincy, Illinois
Saratoga Springs, New York
Taunton, Massachusetts
Toledo, Ohio
Vicksburg, Mississippi
Waltham, Massachusetts
West Troy, New York
Wilmington, North Carolina
Woonsocket, Rhode Island

1854 Bethlehem, Pennsylvania
Cohoes, New York
Cumberland, Maryland
Dorchester, Massachusetts

Dubuque, Iowa
Fredericksburg, Virginia
Gardiner, Maine
Glenn's Falls, New York
Gloucester, Massachusetts
Hagerstown, Maryland
Honesdale, Pennsylvania
Knoxville, Tennessee
Lafayette, Indiana
Malden and Melrose, Massachusetts
Marblehead, Massachusetts
Mount Holly, New Jersey
Nantucket, Massachusetts
New Brunswick, New Jersey
Newton and Watertown, Massachusetts
Norwalk, Connecticut
Norwich, Connecticut
Pittsfield, Massachusetts
Rock Island, Illinois
Rockland, Maine
Rondout and Kingston, New York
Roxbury, Massachusetts
Sandusky, Ohio
Springfield, Illinois
Warren, Rhode Island
Waterbury, Connecticut
West Cambridge, Massachusetts
Winchester, Virginia
Yonkers, New York

1855 Atlanta, Georgia
Batavia, New York
Bloomington, Illinois
Bristol, Rhode Island
Carlisle, Pennsylvania
Davenport, Iowa
Elizabeth, New Jersey
Flushing, New York
Galena, Illinois
Great Barrington, Massachusetts
Harrisburg, Pennsylvania
Keokuk, Iowa
Kingston, Pennsylvania
Lansingburg, New York
Madison, Wisconsin
Meadville, Pennsylvania
North Attleboro, Massachusetts
Ogdensburg, New York
Ottawa, Illinois
Peekskill, New York
Peoria, Illinois
Piqua, Ohio
Portsmouth, Ohio
Portsmouth, Virginia

Racine, Wisconsin
Stamford, Connecticut
Washington, D.C. Xenia, Ohio

1856 Akron, Ohio
Bellefont, Pennsylvania
Bristol, Pennsylvania
Canton, Ohio
Catasequa, Pennsylvania
Chester, Pennsylvania
Danville, Pennsylvania
Eastport, Maine
Freeport, Illinois
Hollidaysburg, Pennsylvania
Huntsville, Alabama
Jamaica, New York
Janesville, Wisconsin
Johnstown, Pennsylvania
Lambertville, New Jersey
Lancaster, Ohio
Lebanon, Pennsylvania
Lewistown, Pennsylvania
Montpelier, Vermont
Newark, Ohio
Northampton, Massachusetts
Norwalk, Connecticut
Owego, New York
Paducah, Kentucky
Palmyra, New York
Pottstown, Pennsylvania
Pottsville, Pennsylvania
Poughkeepsie, New York
Salem, New Jersey
Seneca Falls and Waterloo, New York
Sing Sing, New York
Urbana, Ohio
Watertown, Wisconsin
Wilkesbarre, Pennsylvania
Woodstock, Vermont
Wooster, Ohio

1857 Adrian, Michigan
Alton, Illinois
Attleboro, Massachusetts
Bridgeton, New Jersey
Chambersburg, Pennsylvania
Chicopee, Massachusetts
Columbia, California
Danbury, Connecticut
Doylestown, Pennsylvania
Easton, Maryland
Fishkill, New York
Gloversville, New York
Harlem, New York
Huntington, Pennsylvania

Iowa City, Iowa
Jackson, Michigan
Joliet, Illinois
Marietta, Ohio
Massillon, Ohio
Muscatine, Iowa
Newcastle, Delaware
Rahway, New Jersey
Rockford, Illinois
Sacramento, California
Saint Joseph, Missouri
Saint Paul, Minnesota
Selma, Alabama
Staten Island, New York
Ware, Massachusetts
Waverly, Mississippi
West Point, New York
Williamsport, Pennsylvania

1858 Albion, New York
Astoria, New York
Belfast, Maine
Catskill, New York
Charlotte, North Carolina
Clinton, Massachusetts
East Greenwich, Rhode Island
Fort Wayne, Indiana
Freedonia, New York (natural gas)
Fulton, New York
Galveston, Texas
Grand Rapids, Michigan
Greensburg, Pennsylvania
Jacksonville, Missouri
Jersey Shore, Pennsylvania
Kalamazoo, Michigan
Lewisburg, Pennsylvania
Lockhaven, Pennsylvania
Marysville, California
Natchez, Mississippi
Placerville, California
Raleigh, North Carolina
Saint Albans, Vermont
Scranton Gas and Water, Pennsylvania
Walden, New York
Wautoma, Wisconsin
Williamsburg, Virginia
Ypsilanti, Michigan

1859 Altoona, Pennsylvania
Amesbury and Salisbury, Massachusetts
Auburn, New York
Bath, New York
Beverly, Massachusetts
Birmingham, Pennsylvania
Brattleboro, Vermont

Brockport, New York
Burlington, Iowa
Charlotteville, Vermont
Citizens', Brooklyn, New York
Clyde, New York
Dover, Delaware
Fayetteville, North Carolina
Flemington, New Jersey
Freemont, Ohio
Galion, Ohio
Gettysburg, Pennsylvania
Greensboro, North Carolina
Hannibal, Missouri
Haverstraw, New York
Hempstead, New York
Kittanning, Pennsylvania (questionable)
La Crosse City, Wisconsin
Leavenworth, Kansas
Lyons, New York
Metropolitan (New York City), New York
Middleboro, Massachusetts
Morrisania, New York
Morristown, New Jersey
New Bern, North Carolina
Niagara Falls, New York
North Bridgewater, Massachusetts
Norwalk, Ohio
Nyack, New York
Orange, New Jersey
Peoples', Chicago, Illinois
Plattsburg, New York
Portland, Oregon
Port Lavacca, Texas
Richmond, Massachusetts
Ripley, Ohio
Rutland, Vermont
Sag Harbor, New York
Salem, Ohio
Salisbury, North Carolina
Sandwich, Massachusetts
Southbridge, Massachusetts
Staunton, Virginia
Tarrytown and Irvington, New York
Vincennes, Indiana
Washington, North Carolina
Willimantic, Connecticut
1860 Aurora, Indiana
Carbondale, Pennsylvania
Claremont, New Hampshire
Cold Spring, New York
Cold Water, Michigan
Delaware, Ohio
Dobbs' Ferry, New York

Greenfield, Massachusetts
Hornellsville, New York
Keene, New Hampshire
Laconia, New Hampshire
Oberlin, Ohio
Owensboro, Kentucky
Penn Yan, New York
Plainfield, New Jersey
Port Chester, New York
Port Jervis, New York
South Adams, Massachusetts

1861 Battle Creek, Michigan
Calais, Maine
East Hampton, Massachusetts
East New York, New York
Hayesville, Massachusetts
Holyoke, Massachusetts
Homer and Cortlandt, New York
Le Roy, New York
Little Rock, Arkansas
Norwich, New York
Painesville, Ohio
Warren, Ohio

1862 Hoboken, New Jersey (works not built as of June 15, 1863)

Gas Companies listed on June 15, 1863, for which no charter date is given

Beloit, Wisconsin	Newton, New Jersey
Brownville, Pennsylvania	Newton, Pennsylvania
Clarkesville, Tennessee	Norfolk, Virginia
Dover, New Hampshire	Northern Liberties, Pennsylvania
Ellicotts' Mills, Maryland	North Adams, Massachusetts
Exeter, New Hampshire	Quincy, Massachusetts
Fair Haven, Connecticut	Saco, Maine
Fifth Ward (Milwaukee), Wisconsin	Saint Johnsbury, Vermont
Hamilton, Ohio	Salisbury Mills, Massachusetts
Hastings, New York	Salmon Falls, Maine
Indianapolis, Indiana	San Antonio, Texas
Jackson, Mississippi	San Diego, California
Jackson, California	Saugerties, New York
Jacksonville, Florida	Shreveport, Louisiana
Jacksonville, Indiana	Smyrna, Delaware
Jamestown, New York	South Boston, Massachusetts
Jeffersonville, Maryland	Springfield, Ohio
Lockport, New York	Steubenville, Ohio
Mansfield, Ohio	Stockton, California
Marlboro, Massachusetts	Tamaqua, Pennsylvania
Mauch Chunk, Pennsylvania	Terre Haute, Indiana
Medina, New York	Thompsonville, Connecticut
Meriden, Connecticut	Tiffin, Ohio
Middletown, New York	Westfield, Massachusetts
Milford, Massachusetts	Weston, Ohio
Milledgeville, Georgia	White Plains, New York

Milton, Pennsylvania
Mount Vernon, Ohio
New Britain, Connecticut

Woburn, Massachusetts
Yorkville, South Carolina

<<< [Previous](#)

<<< [Contents](#) >>>

[Next](#) >>>

myers/appendix.htm
Last Updated: 30-Nov-2007

NATIONAL PARK SERVICE

Gaslighting in America A Guide for Historic Preservation



NOTES

1. Fredrick Accum, *A Practical Treatise on Gas-Light* (London: R. Ackermann, 1815), p. 115. Accum's name, given as Fredrick on the title page of his book, was actually Friedrich Christian Accum.
2. This remarkably early view of a gaslighted interior has been reproduced in color in J. B. Priestley, *The Prince of Pleasure and his Regency 1811-1820* (New York: Harper & Row, 1969), plate 15.
3. Accum, *Practical Treatise*, p. 118. Accum is actually referring here to his plate 4, but his statement applies with equal validity to his plate 5. His description of his plates 3-5 is found on pp. 115-121.
4. Dean Chandler, *Outline of History of Lighting by Gas* (London: South Metropolitan Gas Company, 1936), p. 200. This dates the first advertisement for the Welsbach mantle as having appeared in December 1890.
5. *Ibid.*, p. 87.
6. Letter of August 20, 1976, from J. P. A. Scott to W. Brown Morton III, in Office of Archeology and Historic Preservation files. Scott, who is Museum Assistant, Illumination Collection, at the Science Museum, South Kensington, London, dates the engravings between 1820 and 1830 on the basis of firmly dated fixtures in the museum's collection.
7. *Journal of the Franklin Institute*, 3rd ser. (Philadelphia: Franklin Institute), 37(1859): 125-126; an advertisement in *The American Gas-Light Journal*, 2(1860):164 gives the American patent date.
8. Starr, Fellows, and Company, *Illustrated Catalogue of Lamps, Gas Fixtures, &c.* ([New York], 1856), plates 31, 41. The Academy of Music in New York, built in 1854, had brackets in the form of chimerical creatures (plate 27) and the hall chandelier of 1854 in the Wickham-Valentine House (Valentine Museum) in Richmond, Virginia, has branches in the form of dragons. The January 1973 issue of *Antiques* shows a full-color view of the Richmond example. The rather repulsive (except for a herpetologist!) bracket in the form of a rattlesnake was one of a series of fixtures designed in 1859 by Joseph Goldsborough Bruff (1804-1889) for the south wing of the U.S. Department of the Treasury in Washington; Washington, D. C., National Archives, Record Group 121, Records of the Public Buildings Service, "Photographs of Designs, Bureau of Construction, Treasury Department."
9. First National Bank in St. Louis, *St. Louis—A Fond Look Back* (St. Louis, 1956). A lithograph of J. Y. Hart's "Capitol Oyster Saloon and Restaurant" shows counterweighted water-seal chandeliers with smoke bells over the burners. The Seabury Tredwell House (Old Merchant's House) of 1832 in New York City has a fine bronze-finished pair of neoclassical counterweighted water-seal gaseliers that appear to be as old as the house. Curiously, the

James Lancaster Morgan House of 1870 in Brooklyn had a counterweighted water-seal gaselier in the front hall as well as one in the dining room that exemplified the Neo-Grec style; John A. Kouwenhoven, *The Columbia Historical Portrait of New York* (Garden City: Doubleday and Company, 1953), pp. 369-370; the Morgan dining room is also illustrated in William Seale, *The Tasteful Interlude* (New York: Praeger Publishers, 1975), p. 103.

10. Stereograph by G. W. Wilson, Aberdeen, "Abbotsford—The Library. No. 574," author's collection.

11. Edward Everett Hale, *A New England Boyhood* (Boston: Little, Brown and Company, 1927), p. 5. Hale, born in 1822 and writing in 1893, was reporting a personally observed circumstance.

12. Marjorie Drake Ross, *The Book of Boston — The Victorian Period — 1837 to 1901* (New York: Hastings House Publishers, 1964), p. 71.

13. Marshall B. Davidson, *Life in America* (Boston: Houghton Mifflin Company, 1951), 2:12. The scene shown in the Thayer lithograph is identified as "Tremont House;" and as "the ballroom of Tremont House" in Marshall B. Davidson, *The American Heritage History of American Antiques from the Revolution to the Civil War* (New York: American Heritage Publishing Company, 1968), p. 331. However, William Havard Eliot, *A Description of Tremont House with Architectural Illustrations* (Boston: Gray and Bowen, 1830), shows that no such ballroom existed in the hotel.

14. Edgar Allan Poe, "Philosophy of Furniture" (1840), *The Complete Tales and Poems of Edgar Allan Poe* (New York: The Modern Library, 1938), p. 464.

15. Voucher, "Miscellaneous Treasury Accounts of the General Accounting Office, 1790-1894," National Archives, Record Group 130. Information courtesy of William Seale. Loris S. Russell, "Early 19th Century Lighting," *Building Early America* (Radnor, Pennsylvania: Chilton Book Company, 1976), p. 197. Russell states the chandeliers were "oil fixtures;" he was misinformed.

16. Oliver E. Allen, "The Lewis Albums," *American Heritage* (December 1962), pp. 65-80; includes color illustration.

17. "The cast pillar icicles, and other pendulous ornaments of these splendid lamps, are the first of the kind presented to the public from American sources, and they bear a strict scrutiny for transparency, lustre, and workmanship." *Journal of the Franklin Institute*, n.s. 13 (Philadelphia, 1834), p. 93.

18. A handsome G. and W. Endicott lithograph in the Bella C. Landauer Collection at the New York Historical Society shows three chandeliers and two brackets in the ladies' saloon. The ill-fated "Atlantic" made her first trip on August 18, 1846, and was lost by shipwreck in November of that same year. She manufactured her gas on board. John H. Morrison, *History of American Steam Navigation*, (New York: Stephen Daye Press, 1958), p. 328. Except for Long Island Sound and Hudson River vessels, few steamboats used gaslighting. The flexing of limber-hulled Western river boats made gas impracticable, as did the motion of ocean-going ships. Hudson River steamboats used compressed, or "liquid," gas to supply their chandeliers. *Doggett's New York City Directory* for 1846-1847 listed "Charles Starr, liquid gas," at 117 Fulton Street. *Wilson's Business Directory of New York City* for 1860 listed six firms under the heading of "Gas Works (Portable)," among them the "New York Car and Steamboat Company" at the premises listed in 1846-1847 for Starr. On October 1, 1859, *The American Gas-Light Journal* carried an advertisement by S. B. Bowles for "gas apparatus for cars."

19. Cf., plate 50 of this report. After Charles Goodyear patented his vulcanization process on June 15, 1844, it became possible to make rubber hose with which to attach gaslamps to chandeliers, pendants, or brackets. A lithograph illustration in Charles Ellery Stedman [Chinks], *Mr. Hardy Lee, His Yacht* (Boston: A. Williams and Company, 1857) shows a lamp suspended from a chandelier by what appears to be a flexible hose, although it may be a very slender metal duct. The lamp has an apparently paper octagonal shade, and jointed brackets in another illustration in Stedman's pseudonymous work have what seem to be fluted paper shades. These and other lithographs by "Chinks" are reproduced in *American Heritage*, June 1964), pp. 24-31.

20. Thomas U [stick] Walter and J. Jay Smith, *A Guide to Workers in Metal and Stone: For the Use of Architects and Designers, Black and White Smiths, Brass Founders, Gas Fitters, Iron Masters, Plumbers, Silver and Goldsmiths, Stove and Furnace Manufacturers, Pattern Makers, Marble Masons, Stucco Workers, Carvers and Ornamental Workers in Wood, Potters, Etc., From Original Designs, and Selections Made from Every Accessible Source, American and European* (Philadelphia: Carey and Hart, 1846), plate 17.

21. The George Washington Whittemore House of 1850 that formerly stood at 329 Harvard Street in Cambridge, Massachusetts, had four brackets, each with seven gas candles, in the parlor. The sleeves forming the "candles" were porcelain.

22. "Cornelius & Baker are the most extensive manufacturers of lamps, chandeliers, gas fixtures, &c., in the United States, employing upwards of seven hundred persons in the several departments of the establishment..." *The Art-Journal Illustrated Catalogue — The Industry of All Nations 1851* (London: George Virtue, 1851), p. 212; "The pioneer establishment in this manufacture, [of lamps and chandeliers] and the one which, in extent, is now confessedly without an equal in Europe or America, is that of Cornelius & Baker." Edwin T. Freedley, *Philadelphia and Its Manufactures: A Hand-Book Exhibiting the Development, Variety, and Statistics of the Manufacturing Industry of Philadelphia in 1857. Together with Sketches of Remarkable Manufactories; and a List of Articles Now Made in Philadelphia* (Philadelphia: Edward Young, 1859), p. 352; "To-day a single firm or establishment in this country, that of the Messrs. Cornelius and Sons, of Philadelphia, Penn., makes nearly one-half of all the gas fixtures manufactured in the United States, which, together with the unsurpassed, if not wholly unequalled character as well, of their wares, renders them the representative manufacturers in their line." Horace Greeley, *et al*, *The Great Industries of the United States: Being an Historical Summary of the Origin, Growth, and Perfection of the Chief Industrial Arts of this Country* (Hartford: J. B. Burr and Hyde, 1873), p. 308. From these quotations it would appear that the Cornelius firm held its lead from before 1851 until at least 1873.

23. Charles S. Cornelius, *History of the Cornelius Family in America* (Grand Rapids, Michigan, 1926), 8, pp. 2-4; 10, pp. 48-49.

24. Pyne Press, *Lamps & Other Lighting Devices — 1850-1906* (Princeton: The Pyne Press, 1972), p. 21. Instead of 1783, "about 1800" is also mentioned as the time of Christian Cornelius's arrival. Greeley, *Great Industries*, p. 315.

25. Pyne Press, *Lamps*, p. 21.

26. Dean Hale, "Diary of an Industry," *The American Gas Journal* (1970), unpaginated reprint.

27. Greeley, *Great Industries*, p. 315.

28. *Ibid.* "In 1831, Robert was admitted to the partnership, under the style Cornelius and Son..." However, a letter dated June 30, 1840, to Colonel S. Birdsall from the firm, stating that fixtures for the North Carolina Capitol at Raleigh had been shipped, was signed "Cornelius & Co." North Carolina Archives, ST P&C of SC 1839-45. It should be noted that those fixtures were fitted for real candles, not gas. The print in Walter's *Guide to Workers in Metal and Stone* refers to "Cornelius and Son," but *McElroy's Philadelphia Directory* consistently lists the firm as "Cornelius & Co." from 1841 through 1856. As has already been seen in footnote 22, the firm was styled "Cornelius & Baker" by the *Art-Journal* as early as 1851. It therefore seems reasonable, despite directory listings, to date the change from "Cornelius & Co." (or "Cornelius & Son") to "Cornelius, Baker & Co." from the death of Christian Cornelius in 1851.

29. *Directory of American Biography*, 1935 ed., s.v. "Gerard Troost." Dr. Gerard Troost had been sent on a scientific expedition to Java by King Louis of Holland before coming to Philadelphia in 1810. He was a founder and first President of the Academy of Natural Sciences in Philadelphia and went in Robert Dale Owen's famous "boat-load of knowledge" to New Harmony, Indiana in 1825. In 1827 he went to Nashville, Tennessee, where he joined the faculty of the University of Nashville in 1828. He was one of the most eminent American scientists of his day.

George C. Groce and David H. Wallace, *The New York Historical Society's Dictionary of Artists in America—1564-1860* (New Haven: Yale University Press, 1957), pp. 151-152. James Cox was an English born-Philadelphia artist of considerable prominence as a teacher. He had a library of over 5,000 books on art, a very large collection for the time, which he ultimately sold to the Library Company of Philadelphia. If one may judge from the caliber of his teachers, Robert Cornelius could hardly have received better instruction.

30. Greeley, *Great Industries*, p. 315.

This remarkably early daguerreotype portrait has been reproduced in *American Heritage* (December 1956), p. 50; an excellent account of Robert Cornelius' career as a daguerreotypist is contained in Philadelphia Museum of Art, *Philadelphia, Three Centuries of American Art, Bicentennial Exhibition, April 11 to October 10, 1976* (Philadelphia, 1976), pp. 311-313.

31. Dean Hale, "Diary of an Industry," *The American Gas Journal* (1970), unpaginated reprint.

32. Reproduced in *American Heritage* (October 1969), p. 48. The ultimate source is not noted, but was probably *Harper's Weekly* or *Frank Leslie's Illustrated Newspaper*.

33. Photographs taken in 1916, now in the Armory Museum files, and an old photograph of a Myers House interior reproduced in William Rotch Ware, *The Georgian Period*, Boston, American Architect and Building News Company, 1899-1902, illustrate these chandeliers.

34. The inversion of the detail in the Baltimore examples may have been the result of the original assembly, but it suggests that it is highly advisable, before disassembling a complicated chandelier for cleaning or repair, to photograph it for record.

35. The Daughters of the American Revolution Museum example is in the Missouri State Room, and the Missouri Historical Society's chandelier is in a permanent display representing the Ladies' cabin of a Mississippi steamboat.

36. Edwin T. Freedley, *Philadelphia and Its Manufactures* (Philadelphia, Ed. Young, [1859]), p. 355.

37. J. B. Chandler, *Description of the Establishment of Cornelius and Baker, Manufacturers of Lamps, Chandeliers and Gas Fixtures*, Philadelphia (Philadelphia, [1860]), p. 20. Was the reference to the Kremlin merely advertising hyperbole or based on fact? It has not been possible to answer that question. The architect Konstantin Andreevich Ton completed the Great Palace in the Moscow Kremlin for Tsar Nicholas I in 1849. Because the monarch esteemed George Washington Whistler (1800-1849), the American engineer who built the Saint Petersburg-Moscow Railway, so much that he honored him with the Order of St. Anne in 1847, it may be possible that he admired American industry enough to order some of his new palace chandeliers from Cornelius and Company. *Dictionary of American Biography*, 1936 ed., s.v. "George Washington Whistler."

38. Starr, Fellows and Company's Illustrated Catalogue, plate 31. The figure numbered 700 has branches identical with those on several chandeliers at Quarters One, Springfield Armory, as seen in 1916 photographs. Craig Littlewood, a craftsman experienced with Cornelius castings, believes the morning-glory branch is a Cornelius design.

39. The Metropolitan Museum of Art, *19th-Century America—Furniture and Other Decorative Arts* (New York: New York Graphic Society, Ltd., 1970), item 113. The chandelier is illustrated in color. Charles Lockwood, *Brick and Brownstone* (New York: McGraw-Hill, 1972), p. 204. Illustrates similar glass elements on a chandelier fitted for eight gas candles.

40. A. D. Jones, *The Illustrated American Biography; Containing Correct Portraits and Brief Notices of the Principal Actors in American History*, vol. 2 (New York: J. Milton Emerson and Company, 1854), pp. 406, 413.

41. *The American Gas-Light Journal*, June 15, 1863), pp. 370-373. List of 433 gas companies in the United States with the dates of their charters. See Appendix.

42. Archer and Warner, *A Familiar Treatise on Candles, Lamps and Gas Lights; with Incidental Matters, Prepared for the Use of their Customers by Archer & Warner, Manufacturers of Gas Fixtures, Chandeliers, Lamps, Girandoles, &c.* (Philadelphia, [1850]), *passim*. Freedley, *Philadelphia and Its Manufactures*, p. 438.

43. Viggo Rambusch, "Technical article: lighting for restorations," *Interiors* (April 1975), p. 172.

44. *Ibid.*

45. Craig Littlewood, who has restored many gas fixtures and lamps, has observed this to be the case.

46. The Metropolitan Museum of Art, *19th-Century America—Furniture*, items 131, 134, and 135. The cover shows the bronzes in color with other details.

47. Southwestern Bell Telephone Company, *A St. Louis Heritage: Six Historic Homes*, (St. Louis: 1967), pp. 26-27. The Campbell House parlor is illustrated in color. Richard Hubbard Howland, "Tuscan Transplant," *Arts in Virginia* (1968), 9:6.

48. *Art-Journal Illustrated Catalogue* (1851), p. 212.

49. Benjamin Silliman, Jr., and Charles R. Goodrich, eds., *The World of Science, Art, and Industry Illustrated from Examples in the New York Exhibition, 1853-1854* (New York: G. P. Putnam and Company, 1854), p. 157.

50. *Ibid.*, p. 158

51. Greeley, *Great Industries*, p. 315. Pyne Press, *Lamps*, p. 17.

52. *McElroy's Philadelphia Directory*, 1853.

53. *Boyd's Philadelphia City Business Directory*, 1861.

54. Freedley, *Philadelphia and Its Manufactures*, p. 352, plate opp. p. 35.

55. Federal Writers' Project, *Washington City and Capital* (Washington, D. C.: Government Printing Office, 1937), p. 655.

56. *Frank Leslie's Illustrated Newspaper* (1863), pp. 42-43.

57. Cornelius and Baker, *Description*, p. 24; Freedley, *Philadelphia and Its Manufactures*, p. 356.

58. Nicholas B. Wainwright, *Philadelphia in the Romantic Age of Lithography* (Philadelphia: The Historical Society of Pennsylvania, 1958), pp. 110-112.

59. Jones, *Illustrated American Biography* 2(1854):401.

60. This print has been frequently illustrated: e.g., E. Douglas Branch, *The Sentimental Years 1836-1860* (New York: D. Appleton-Century Company, 1934), opp. p. 252; Davidson, *Life in America* 2:40; Kouwenhoven, *Columbia Historical Portrait of New York*, p. 225; and Harold L. Peterson, *Americans at Home from the Colonists to the Late Victorians* (New York: Charles Scribner's Sons, 1971), plate 197.

61. Kouwenhoven, *Columbia Historical Portrait*, p. 282.

62. Wainwright, *Philadelphia in the Romantic Age*, pp. 87, 153. This ornate store, designed by John Fraser, had a two-story showroom and measured 55 feet wide by 175 feet deep.

63. Jones, *Illustrated American Biography* 2(1854):81, 121, 125.

64. Reproduced in Kouwenhoven, *Columbia Historical Portrait*, p. 273.

65. This watercolor, now in the Bertram K. and Nina Fletcher Little Collection, has been reproduced in Peterson, *Americans at Home*, plate 91.

66. The Metropolitan Museum of Art, *19th-Century America—Furniture*, item 112. A color illustration showing this lamp in a period room installation appeared in *Antiques* (September 1970), p. 405.

67. *Doggett's New York City Business Directory; Wilson's Business Directory of New York City; The New York City Mercantile Register* (1848-1849). The *Mercantile Register* carried an advertisement stating that Johnson's Gas Fittings and General Brass Works made gas pipes and fittings, plain and fancy brass tubing, pendants, brackets, chandeliers, brass bedsteads, gas burners, and cocks. Among the well-known firms listed by Wilson during the 1850s were: 1) Archer, Warner and Company, 376 Broadway; 2) John Cox and Company, 349 Broadway "Importers and dealers in French, English and American gas fixtures;" 3) H. Dardonville, 445 Broadway "Importer of French gas fixtures;" 4) (1854) Mitchell, Bailey and Company; 5) Ringuet Leprince, Marcotte and Company; 6) (1855) Tiffany and Company, 550 Broadway; 7) (1858) Mitchell, Vance and Company; 8) Warner, Peck and Company;

and, of course, 9) (1859) Starr, Fellows and Fellows, Hoffman and Company. Wilson's *Business Directory* for 1860 listed among the 24 gas fixture makers the following: 1) Archer, Pancoast and Company, wholesale manufacturers, 9 Mercer Street; 2) Fellows, Hoffman and Company; 3) E. V. Haughwout and Company, 488 Broadway; 4) Isaac P. Frink, 104 Worth Street; 5) Mitchell, Vance and Company, 620 Broadway and 339 W. 24th Street; 6) Tiffany and Company; and 7) Warner, Peck and Company. Note that several firms listed themselves as importers of French or English fixtures. E. V. Haughwout's billhead (reproduced in Kouwenhoven, *Columbia Historical Portrait*, p. 245) characterized the firm as "wholesale and retail dealers in Cornelius & Baker's chandeliers & gas fixtures," among other items. The fine cast-iron store erected by Haughwout in 1857 at Broadway and Broome Streets still stands. Tiffany dealt in more than jewelry; Ringuet Leprince, Marcotte and Company was a leading decorating and furniture making firm of New York.

68. A circular letter dated March 2, 1857, pasted to the endpaper of the Starr, Fellows catalogue says,

The co-partnership heretofore existing under the name and style of Starr, Fellows & Co. expired by limitation on the first of February, 1857. Wm. H. Starr, so long and so favorably known as the head of the house having sold his interest therein to the remaining partner and they having associated with themselves Mr. J. A. G. Comstock, the business will be continued as heretofore, at the same locality, under the name and style of Fellows, Hoffman & Co. . . .

In 1847, William H. Starr, lamps, was listed at 67 Beekman Street, and in 1854 Starr, Fellows and Company was listed at the same address with a notation that the address after August 1 would be 74 Beekman Street. This was the locale of Starr, Fellows, and from 1857 through 1870, Fellows, Hoffman and Company. (*Doggett's New York City Directory*; *Wilson's Business Directory of New York City*). The co-partnership was first composed of William H. Starr, Charles H. Fellows, Charles O. Hoffman, James G. Dolbeare, and George Nichols. Upon the withdrawal of Starr in 1857, the partners were Fellows, Hoffman, Jeremiah A. G. Comstock, Dolbeare, and Nichols. In 1876 the firm was listed at 631-633 Broadway and advertised as "manufacturers of gas fixtures and importers of French bronzes, crystal gas fixtures, French clocks, statuettes, &c." By 1881, they were listed as C. H. Fellows, Hoffman and Company, gas fixtures, at 206 Canal Street, evidently a descent from the eminence of Broadway, and no later listings appeared. (*Wilson's New York City Co-Partnership Directory*; *Trow's New York City Directory*).

69. The catalogue now in the library of Old Sturbridge Village, Sturbridge, Massachusetts, has about 50 lithographed plates, half of them illustrating gas fixtures. The others illustrate oil lamps. The gilt-embossed cloth cover of the quarto volume shows an oil-lamp chandelier. A few fragments of what appears to have been an Archer and Warner catalogue of the early 1850s have been found attached to correspondence in the National Archives (R.G. 121) relating to the furnishing of the U. S. Custom House in Wheeling, West Virginia.

70. The word "slides" refers to cork-sealed, sleeved stem pipes that could be extended to allow the adjustment of the pendant or chandelier to any height desired.

71. Illustrated in *Antiques* (July 1970), p. 96.

72. Because two other Whittemore chandeliers had Starr, Fellows branches, it is possible, unless the supplier dealt with two or more manufacturers, that the attribution should be to the New York firm rather than to Cornelius and Baker.

73. Illustrated in William Seale, *The Tasteful Interlude: American Interiors through the Camera's Eye, 1860-1917* (New York: Praeger Publishers, 1975), p. 137, plate 112.

74. Illustrated in *Antiques* (May 1976), p. 1034. The globes belong properly to lamps, not to a gaselier.

75. *Op. cit.*, Silliman and Goodrich, p. 158.

76. *McElroy's Philadelphia Directory*, 1841-1872; *O'Brien's Philadelphia Wholesale Business Directory*, 1843-1857; *Boyd's Philadelphia City Business Directory*, 1859-1860; *Cohen's Philadelphia City Directory*, 1860. An attestation dated August 25, 1859, giving the precise dates of the Archer, Warner, and Miskey partnership, is on file in the Office of the Architect of the Capitol, Washington, D. C.

77. *Wilson's Business Directory of New York City*, 1853-1860; *Wilson's Co-Partnership Directory*, 1857-1861; *Trow's New York City Directory*, 1861-1902.

78. The Metropolitan Museum of Art, *19th-Century America—Furniture*, item 103; Denys Peter Myers, *Maine Catalogue—The Historic Architecture of Maine* (Augusta: The Maine State Museum, 1974), pp. 121-122. If the J. J. Brown House was equipped with gas when built in 1845, the attribution should be to Archer solely, as Warner did not become a partner until 1848. It should be noted that the Portland Gas-Light Company was not chartered until 1849, but it may well have begun operations, like several other gas companies, before receiving its charter.

79. Freedley, *Philadelphia and Its Manufactures*, p. 438.

80. *Ibid.*, p. 439.

81. *Ibid.* The railing is illustrated in Myrtle Cheney Murdock, *Constantino Brumidi—Michelangelo of the United States Capitol* (Washington: Monumental Press, Inc., 1950), p. 9.

82. Thomas Webster and Frances Byerley Parkes, *An Encyclopaedia of Domestic Economy* (New York: Harper and Brothers, 1849), p. 202, para. 764. The first edition appeared in London in 1844, the year of Goodyear's patent (see footnote 19).

83. It has not been considered necessary to discuss governor burners in detail as their use in America was so limited. William Sugg, the English manufacturer of gas equipment, developed a number of such devices, the best of which was probably one introduced around 1880 that used a steatite float. As early as 1867, Julius Bronner of Frankfurt-am-Main produced a governor burner with a steatite plug, and one Giroud developed a patent governor called a "Rheometer" in 1871 that was improved by one Peebles in 1875. Chandler, *Outline*, pp. 91-95.

84. The Oertel painting is illustrated in Peterson, *Americans at Home*, plate 126. Plate 167 in Peterson reproduces half of a D. R. Holmes stereograph taken around 1875 of Senator Charles Sumner's study. A gaslamp attached by a hose to a chandelier may be clearly seen.

85. An interior photograph of the Leland Stanford House of 1869-1871 in Sacramento, California, shows a six-branched chandelier with an additional central burner that could be lowered by what appears to be Monson's patent device. See Seale, *Tasteful Interlude*, p. 47, ill. 21.

86. G. and D. Cook and Company's *Illustrated Catalogue of Carriages and Special Business Advertiser* (New Haven: Baker and Godwin, 1860; reprinted ed., New York: Dover Publications, Inc., 1970), p. 138. Dover Publications reprinted the Cook catalogue in 1970 as part of their Dover Pictorial Archive Series. Because the patent was dated ca. 1860, and

because the Civil War brought construction by the Treasury Department to a halt until well after Bowman was transferred to other duties, it is uncertain whether many Monson patent equipped fixtures were actually used in Federal buildings.

87. William Paul Gerhard, *The American Practice of Gas Piping and Gas Lighting in Buildings* (New York: McGraw Publishing Company, 1908), p. 146.

88. Winslow Ames, "The Vermont Statehouse and Its Furniture," in *Antiques* (August 1965), pp. 200-204; Cornelius and Baker, *Description*, p. 24.

89. Ames, "Vermont Statehouse."

90. Cornelius and Baker, *Description*, pp. 23-24.

91. Freedley, *Philadelphia and Its Manufactures*, p. 355.

92. Mario E. Campioli, "Building the Capitol," in Charles E. Peterson, ed., *Building Early America—Contributions Toward the History of a Great Industry* (Radnor, Pennsylvania: Chilton Book Company, 1976), p. 227.

93. Freedley, *Philadelphia and Its Manufactures*, p. 356.

94. Data sheet dated June 14, 1968, accompanying negative #12567 on file in the Office of the Architect of the Capitol.

95. "The California Trail" in Thomas Froncek, "Winterkill, 1846," in *American Heritage* (December 1976), pp. 35-41. Additional data supplied by Donald J. Lehman.

96. Washington, D. C., National Archives, R.G. 121. Records of the Public Buildings Service, Office of the Supervising Architect, "Photographs of Designs, Bureau of Construction, Treasury Department."

97. The Hawthorne painting is reproduced in color in *American Heritage* (February 1971), pp. 30-31.

98. Peterson, *Americans at Home*, plate 200. This plate reproduces the Hawthorne in black and white. Peterson mistakes the striped flooring not uncommon in the 1860s, for floor cloth and incorrectly surmises that the beer pumps dispensed "coffee or other non-alcoholic beverages."

99. The small hook shown on plate 60 above the burner was provided for the purpose of hanging a smoke bell.

100. The Stanton Hall bronze fixtures are alleged to have been imported from France. However, no documentary evidence has been produced to support the allegation, except that the term "French bronze" has long been associated with the fixtures. Against the contention that they were imported may be cited the fact that "French bronze" was a common trade term used to designate a particular finish. Furthermore, no French fixtures are known that resemble the Natchez examples in style, whereas many examples of the Philadelphia school resemble them closely. All the allegorical subjects on them that can be identified refer to American history. It may be observed that several marked fixtures by Cornelius and Baker are extant in Natchez.

101. *The Art-Journal; The Illustrated Catalogue of the Universal Exhibition Published with The Art Journal* (London: Virtue and Company, [1867]), p. 139.

102. Treasury Department data were supplied by Donald J. Lehman.

103. Unfortunately, despite their promise, the editors of *The Art Journal* did not mention the "interesting process" elsewhere in the *Illustrated Catalogue*.

104. The publication in 1868 in London of Eastlake's *Hints on Household Taste* spread his ideas like wildfire. Even before the first American edition of his influential work appeared in 1872, arbiters of taste in this country were pressing for the adoption of his rather ascetic aesthetic principles.

105. Jay E. Cantor, "A Monument of Trade—A. T. Stewart and the Rise of the Millionaire's Mansion in New York," *Winterthur Portfolio* 10 (Charlottesville, Virginia: University Press of Virginia, 1975), pp. 165-197. Cantor's article discusses both the aesthetic and the sociological significance of the house. The photographs of the interiors shown here on plates 66 and 67 are reproduced from *Artistic Houses* (New York: D. Appleton and Company, 1883-1884), vol. 1, part 1. The difference in design concept between the Stewart drawing room fixtures of 1869 and the Morse-Libby House music room chandelier of 1863 (plate 62) is obvious when the two plates are compared. Clearly, a new trend was setting in. Elm Park, the Lockwood-Matthews Mansion of 1868 in Norwalk, Connecticut, probably the most lavish American country house of its time, originally had gas fixtures similar to the Stewart chandeliers, but they were lighter in design. See Seale, *Tasteful Interlude*, pp. 43-45.

106. For examples of the type, see plates 73, 83, 84, 85, 89.

107. Cantor, "Monument of Trade," p. 187, fig. 22.

108. Dean Hale, "Diary of an Industry." See also note 18.

109. *Cook and Company's Illustrated Catalogue of Carriages*, p. 106. The St. Nicholas Hotel advertisement quotes the *New York Pathfinder* at length and illustrates the hotel's main dining room lighted by three large chandeliers and numerous brackets.

110. Advertising "Letter" dated January 19, 1856, reproduced in Leslie Dorsey Janice Devine, *Fare Thee Well* (New York: Crown Publishing Inc., 1964), pp. 64-65. Possibly the source of the St. Nicholas Hotel lighting system was the Ornamental Iron Works of Philip Tabb at 522 Broadway "opposite St. Nicholas Hotel." Tabb advertised "Portable Gas Works made to order. Contracts taken for building Gas and Water Works. . ." in 1860.

111. Roy T. Bramson, *Highlights in the History of American Mass Production* (Detroit: Bramson Publishing Company, 1945), p. 52.

112. Jones, *Illustrated American Biography*, 2(1854):393. After the development of oil drilling (for petroleum) at Titusville, Pennsylvania, in 1859 by Edwin L. Drake (1819-1880) who appears to have had no connection with O. P. Drake, gasoline replaced benzine as the agent for vaporization in gas machines.

113. *American Gas-Light Journal* (December 1, 1859), p. 103.

114. [Springfield Gas Machine Company], *Circular of the Springfield Gas Machine Co. of Springfield, Mass. Manufacturers of Portable Gas Machines and Contractors for the Erection of Gas Works, Suitable for the Lighting of Mills, Factories, Machine Shops, Hotels, Public Halls, Churches, Blocks of Stores, Private Dwellings, or Any Class of Buildings Beyond the Reach of Coal Gas Mains. Also, Manufacturers of Carbureting Apparatus for the Purpose of Enriching Coal Gas. Also, Dealers in Gasoline for Gas Machines* (Springfield: [Samuel Bowles and Company, 1867]). Testimonials in this eight-page pamphlet are dated

1866 and refer to the satisfactory use of "vapor of Naphtha" (gasoline) in the previous year. *Poor Richard's Gas Catechism for the People* (Springfield, 1870), p. 15 refers to gasoline as the substance from which gas "is made" in portable gas machines. That pamphlet was probably issued by the Springfield Gas Machine Company. The status of the Springfield Gas Machine is indicated by the fact that a leading technical publication of the period illustrated and described that particular device for the major part of its article titled "Gas, Illuminating, Machines for Producing." *Appleton's Cyclopaedia of Applied Mechanics: A Dictionary of Mechanical Engineering and the Mechanical Arts* (New York: D. Appleton and Company, 1880) 1:935-938.

115. The dotted lines running between the house cellar and the buried generator at the left are labeled "Gas Pipe" and "Air Pipe."

116. The Guy painting was reproduced in color in *American Heritage* (April 1966), pp. 8-9. The Johnson painting was reproduced in color in Metropolitan Museum of Art, *19th-Century America—Paintings and Sculpture* (New York: New York Graphic Society Ltd., 1970), item 144, and in *American Heritage* (October 1966), p. 53. A lithograph published in 1865 by *Leslie's Chimney Corner* shows the east room of the White House gaslighted during President Lincoln's Inauguration Day reception. At the other end of the social spectrum, a painting entitled "An Evening at the Ark" done by Julius Gollmann in 1859, now in the Western Reserve Historical Society in Cleveland, shows a cheaply furnished room papered in arsenical green wallpaper during a meeting attended by a group of poorly dressed men. The stark interior is lighted by the single fishtail burner of a plain pendant.

117. The description referred to the steamers "Bristol" and "Providence," built in 1867. Old Colony Railroad, *The Popular Resorts of Massachusetts and Newport, R. I.* (Boston: Old Colony Railroad, 1878).

118. Gerhard, *American Practice of Gas Piping*, p. 146.

119. The Metropolitan Museum of Art, *19th-Century America—Furniture*, item 161.

120. Chandeliers fitted with gas candles are among the types *not* included in the Mount Washington Glass Works display. The firm made shades as well as fixtures and evidently wished to encourage their use. Their advertisements show that they were particularly proud of their painted shades. During the 1880s Louis XVI Revival crystal chandeliers fitted with gas candles were used in some fine mansions. An excellent matching set composed of a chandelier and brackets in that style was in the drawing room of the Oliver Ames, Jr., House (1882) at 355 Commonwealth Avenue in Boston and is illustrated in Seale, *Tasteful Interlude*, pp. 74-75. "[Mount Washington Glass Works] is the only factory in the country where crystal chandeliers are made complete." New Bedford Board of Trade, *History of New Bedford* (New Bedford: Board of Trade, 1889).

121. The Metropolitan Museum of Art, *19th-Century America—Furniture*, items 176, 177. The chandelier is illustrated in color in *Antiques* (September 1970), p. 409.

122. The 1875 firm also included: Samuel Vance, Vice-President; Edgar M. Smith, Secretary Treasurer; and Edward A. Mitchell, and Dennis C. Wilcox, Trustees with these officers. *Wilson's New York City Co-Partnership Directory*, *Wilson's Business Directory of New York City*, and *Trow's New York City Directory*, *passim*. Mitchell, Vance and Company, *Centennial Catalogue of Chandeliers, Gas Fixtures, Bronze Ornaments, Clocks, Etc.* (New York: 1876), *passim*.

123. *Trow's New York City Directory*, 1881.

124. Mitchell, Vance and Company, *Centennial Catalogue*, unpaginated.

125. Other commercial structures included the Equitable Life Assurance Company building in Boston and the Lord and Taylor Store in New York. For the contemporary importance and historic significance of the Tribune and Western Union Telegraph Buildings, see Winston Weisman, "New York and the Problem of the First Skyscraper" in *Journal of the Society of Architectural Historians* 12 (March 1953): 13-21. As Richardson specified Mitchell, Vance and Company fixtures for his Brattle Square Church, it is quite possible that the great corona of 1877 that once gave unity and scale to the crossing of his Trinity Church, Boston was by the same firm. The fixture is illustrated in Van Rensselaer, Mariana Griswold, *Henry Hobson Richardson and His Works* (1888; reprinted., New York: Dover Publications, Inc., 1969), opp. p. 61. The removal of that fixture during "improvements" made in the 1930s was misguided. Fortunately, Mitchell and Vance's somewhat similar corona in Sanders Theatre at Harvard's Memorial Hall in Cambridge still exists.

126. As described further in the *Art Journal*, August, 1875: "The chandelier is massive in appearance, but graceful withal, and is finished in . . . verd-antique, and relieved at prominent points by judicious gilding . . . [it] is one of the most elaborate designs of the kind ever executed in this country. The drawings were made by Mr. Charles C. Perring, Chief designer for the company.

Several of the fixtures illustrated in the Mitchell, Vance and Company *Centennial Catalogue* are also illustrated in more readily available sources, e.g., *A Facsimile of Frank Leslie's Illustrated Historical Register of the Centennial Exposition 1876* (New York: Paddington Press, Ltd., 1974), p. 306 (accompanying text on p. 296) and *Asher and Adams' Pictorial Album of American Industry 1876* (1876; reprint ed., New York: Rutledge Books, 1976), p. 133. Unfortunately, nothing has been discovered concerning Charles C. Perring. He does not appear in any of the standard published reference sources.

127. See plates 15, 27, 53, and 64.

128. *Gopsill's Philadelphia City Directory*, 1887, p. 375.

129. *McElroy's Philadelphia Directory*, 1841-1872.

130. Cornelius and Company issued a 13 page catalogue in 1877 with the title *Examples of Gas Fixtures and other Metal work for Ecclesiastical and Domestic Use. Designed after the Manner of Medieval Art Works by J. M. Beesley*.

131. *Illustrated London News*, May 21, 1853.

132. For the medieval prototype, see Kenneth John Conant, *Carolingian and Romanesque Architecture 800 to 1200* (Baltimore: Penguin Books, 1959), p. 16, fig. 3 (A).

133. *Asher and Adams' Pictorial Album*, p. 49. The article describes the processes carried on at Archer and Pancoast's manufactory and also notes that:

we import bronzes—real and imitation—but only to a very limited extent, as compared with the quantity manufactured at home. Since 1860, the bronze manufacture—the most important feature of which is the production of gas fixtures, has greatly increased in importance. The development of the zinc mines of Lehigh Valley, Pa., and the late discoveries of spelter, as zinc is called in the trade, in New Jersey, Illinois and Missouri, have made American manufacturers altogether independent of foreign mines, and they now turn out goods with which foreign manufacturers cannot successfully compete.

134. Wilson H. Faude, "Associated Artists and the American Renaissance in the Decorative Arts," *Winterthur Portfolio* 10 (Charlottesville, Virginia: University Press of Virginia, 1975), p. 123, fig. 23; Wilson H. Faude, "Mark Twain's House in Hartford, Connecticut," *Antiques* (October 1974), p. 636, fig. 3.

135. *The Art Journal* 2(1876):56.

136. Possibly J. F. Travis was the firm's principal designer, comparable to Charles C. Perring at Mitchell, Vance and Company. Unfortunately, no information about Travis has come to light; he is not listed in any standard reference work.

137. For earlier uses of gas candles, see plates 15 and 71, and note 21 of this report. The Morse-Libby House of 1863 in Portland, Maine, has dining room brackets with gas candles, although the chandelier has shaded burners. The James M. Beebe House ca. 1865 in Boston had a dining room chandelier with a center oil lamp and real candles, but gas candles in the wall brackets. Seale, *Tasteful Interlude*, p. 68, fig. 42. The dining room of the George Finch House in St. Paul had a chandelier dating from around 1880 to 1885 in the Anglo-Japanese taste that was fitted with gas candles. Seale, *Tasteful Interlude*, pp. 94-95, fig. 69.

138. As early as 1844 Petit's Shawl Store in Boston was reported to have single-paned plate glass windows, each containing 48 square feet; and A. T. Stewart's store in New York had French plate glass windows measuring 7 feet wide by 11 feet 2 inches high, or 77 square feet. In 1853, Taylor's Saloon in New York had windows of plate glass 7 feet wide by 16-1/2 feet high. The fact that these were reported in the newspapers indicates that they were exceptional. It was not until 1853 or 1854 that an attempt was made to make plate glass in America. Kenneth M. Wilson, "Window Glass in America," in Charles E. Peterson, ed., *Building Early America—Contributions Toward the History of a Great Industry* (Radnor, Pennsylvania: Chilton Book Company, 1976), pp. 161-164.

139. Isaac P. Frink, *Frink's Patent Reflectors* [New York: 1883]. Patents were issued to Frink on April 10, April 17, and June 12, 1860; December 24, 1861; June 8 and July 7, 1869; February 8, 1870 (patents #3826 and #3827); April 9, 1872; April 17, 1874; May 20, 1879; January 10, 1882; and April 3, 1883.

140. The fixture is illustrated in color in *Antiques* (October 1974), p. 639.

141. Washington, D.C., National Archives, R.G. 42, case 2, folder 9. Richard von Ezdorf was born in the Palazzo Balbi in Venice on the eve of the Revolution of 1848, during which his family suffered much for its loyalty to the Austrian crown. The young aristocrat experienced a particularly bad year in 1866. On July 24 he was wounded at the second Battle of Custozza, and his family sustained grave financial losses after August 23, when Austria signed the Treaty of Prague ceding Venetia to Italy at the end of the Seven Weeks' War. The misfortunes of 1866 may well account for Ezdorfs sailing for New York in 1872 after completing his studies at the Technische Hochschule in Stuttgart, the universities at Innsbruck and Graz, and the Academia del' Arte in Venice. In 1873 he placed his education in architecture, engineering, and the fine arts at the service of the U.S. government. He first appeared on the payroll of the State Department wing of the new State, War, and Navy Building and divided his time between it and other work in the Supervising Architect's office. From 1876 until late in 1886, he was on the War Department rolls while devoting his full time to the State, War, and Navy Building, where the interior ornaments and exterior sculpture were executed from his designs. Thereafter, he was with the Supervising Architect's office again until 1898. He then worked for the Navy Department until 1920, when he retired after more than 47 years in Federal service. He died in 1926. Richard von Ezdorf was an exceptionally gifted designer for his time and a delineator of truly superior talent. Data on

von Ezdorf are based on Donald M. Lehman, *Executive Office Building*, General Services Administration Historical Study No. 3, (Washington: Government Printing Office, 1970), pp. 46-53, 83.

142. Lehman, *Executive Office Building*, p. 49.

143. Washington, D.C., National Archives, R.G. 42.

144. Washington, D.C., National Archives, R.G. 77, Records of the Office of the Chief of Engineers, Fortifications File, 1776-1920, drawer 156, box no. 9.

145. By 1886 small-necked shades were already called "old-fashioned globes." C. J. Russell Humphreys, *Gas as a Source of Light, Heat and Power* (New York: A. M. Callender and Company, 1886), pp. 11-12, figs. 11-12.

146. *McElroy's Philadelphia Directory* and *Gopsill's Philadelphia City Directory*.

147. Interior photographs showing the Horticultural Hall chandeliers are reproduced in Robert C. Post, ed., *1876: A Centennial Exhibition* (Washington: The National Museum of History and Technology, Smithsonian Institution, 1976), pp. 66-67 and 72. *Facsimile of Frank Leslie's*, p. 82 has a wood engraving showing the fixtures. A trade card of Thackera, Buck and Company shows Horticultural Hall and says, "Gas fixtures in this building manufactured by Thackera, Buck and Co." Bella C. Landauer Collection, New York Historical Society, vol. 8A.

148. The Metropolitan Museum of Art, *19th-Century America—Furniture*, item 226.

149. Sir William Robert Graves had demonstrated an incandescent electric light as early as 1840, and Sir Joseph Wilson Swan developed a carbon filament electric light bulb in 1860.

150. Chandler, *Outline of History of Lighting*, p. 194.

151. *Financial News*, March 21, 1887. Quoted in Chandler, *Outline of History of Lighting*, pp. 193-194.

152. *Machinery Market*, April 1, 1887. Quoted in Chandler, *Outline of History of Lighting*, p. 194.

153. The advertisement is reproduced in Chandler on p. 200. The statistics quoted are on p. 201. The chapters entitled "Evolution of the Incandescence System of Gas Lighting" and "Development of Incandescence Gas Burners" in Chandler, pp. 179-220, are singularly detailed and excellently illustrated.

154. The photograph of the Scott Studio is reproduced in David A. Hanks, "Isaac E. Scott, Craftsman and Designer," in *Antiques* (June 1974), p. 1312. Clay Lancaster, *New York Interiors at the Turn of the Century* (New York: Dover Publications, 1976), plate 108.

155. The passage continues: "Quite recently, such lamps have been used in connection with the compressed-gas system for the illumination of railroad cars, both here and abroad, and the mantles seem to be but little affected by the vibration and jarring of the cars." Gerhard, *American Practice of Gas Piping*, p. 124.

156. Chandler, *Outline of History of Lighting*, p. 229.

157. Portions of the catalogue are reproduced in Larry Freeman, *New Light on Old Lamps*

(Watkins Glen, New York: Century House, 1968) pp. 164-174. Prices included artificial candles and bobèches, but glassware, i.e., shades, was extra. The art glass domes and "seed bead" fringe of two fixtures called "Colonial" were included in the prices. The lamps, or "gas portables," could be had with Argand or Welsbach burners at extra charge. Freeman's *New Light* also reproduces 100 turn-of-the-century shades of different fancy patterns on pages 176-179. The Phoenix Glass Company made 40 of the shades. This firm should not be confused with the earlier Phoenix Glass Works that failed on May 1, 1870.

158. See plate 110, below for a lighter of this type.

159. "Gas-Lighting by Electricity" in *The American Gas-Light Journal* (October 1, 1859).

160. Mario E. Campioli, "Building the Capitol," in Charles E. Peterson, ed., *Building Early America*, p. 227, fig. 12.28.

161. "Gas-Lighting by Electricity" in *American Gas-Light Journal* (October 1, 1859). *Journal of the Franklin Institute*, 3rd ser. (1860) 39:283, 385-389.

162. *Journal of the Franklin Institute*, 3rd ser. (1861) 12:349.

163. Lois B. McCauley, *Maryland Historical Prints 1752 to 1889, A Selection from the Robert G. Merrick Collection Maryland Historical Society and other Maryland Collections* (Baltimore: Maryland Historical Society, 1975), p. 112.

164. The title page of *Morris, Tasker and Co.'s Illustrated Catalogue*, reproduced in Diana S. Waite, *Architectural Elements: The Technological Revolution* (New York: Bonanza Books, n.d.), shows the counterweights and pulleys of a gasholder more clearly than the Hoen lithograph does. Robert M. Vogel, ed., *A Report of the Mohawk-Hudson Area Survey* (Washington: Smithsonian Institution Press, 1973), p. 46, reproduces a Historic American Engineering Record drawing of the Troy Gas Light Company Gasholder House, a domed brick structure built in 1873.

165. Park Benjamin, ed., *Appleton's Cyclopaedia of Applied Mechanics: A Dictionary of Mechanical Engineering and the Mechanical Arts* (New York: D. Appleton and Company, 1880), pp. 900-946. Appleton's very detailed technical article on gas and its manufacture notes that purification with lime was then (1880) almost entirely abandoned in favor of "washers" or "scrubbers."

166. On page 131 of a paper entitled "One of the First Meter Makers in the United States," written for the American Gas Association and published in a now unidentified source, H. C. Slaney, the author, says, "It was in Philadelphia that gas was first produced and exhibited by Michael Ambrosie & Co. at their amphitheatre on Arch Street, between 8th and 9th Sts., in the year 1796." Malcolm Watkins mentions a demonstration of gaslight by one Mr. Henfry in 1799 or 1800 in Baltimore. . . . (C. Malcolm Watkins, "Artificial Lighting in America: 1830-1860," in *Annual Report of the Board of Regents of the Smithsonian Institution*. . . . 1951 (Washington: Government Printing Office, 1952), p. 393). David Melville of Newport, Rhode Island, first used gas for domestic lighting (in his own house) in 1806 (Watkins) or 1812 (Dean Hale, "Diary of an Industry"). Melville patented his gas machine either in 1810 (Loris S. Russell, *A Heritage of Light: Lamps and Lighting in the Early Canadian Home* (Toronto: University of Toronto Press, 1968), p. 290) or in March 1813 (Hale). In 1813 Melville installed gaslights in a Watertown, Massachusetts, cotton mill and in a mill near Providence, Rhode Island (Hale). On April 23, 1816, Rembrandt Peale demonstrated gas lighting at the Peale Museum in Baltimore, and on June 17, 1816, an ordinance was passed authorizing the Baltimore Gas-Light Company to lay pipes. The first public lamplighting occurred on February 7, 1817 (Hale). For Samuel Morey's use of water gas in 1817, see Alice Doan

Hodgson, "History in Towns—Orford, New Hampshire," *Antiques*, October 1977, p. 712.

167. *American Gas-Light Journal* (January 1, 1862), pp. 198-199.

168. *Ibid.*

169. *American Gas-Light Journal* (June 15, 1863), pp. 370-373.

170. *Ibid.* See appendix for a chronology of early gaslight companies in America.

171. Slaney, "One of the First Meter Makers in America," p. 131.

172. *Journal of the Franklin Institute*, 3rd ser., no. 1 (January 1848), 15:337-339.

173. *The American Gas-Light Journal* (November 1, 1859), p. 92. Information on the U.S. Treasury building supplied by Donald J. Lehman, from the U.S. Treasury Voucher, 1852 Accounts.

174. Donald McDonald, *Meters and Meter Makers: A Paper Prepared for the Fiftieth Anniversary Number of the American Gas Light Journal*, July 19, 1911 (Albany, New York: C. F. Williams and Son, 1911), p. 22.

175. *Report of the Commissioner of the Patent Office* 1(1868).

176. A Philadelphia lamp post with eagle finial by Morris, Tasker and Company is among the illustrations on the cover of their catalogue, the second edition of which was issued in 1860. The cover and eight plates from the catalogue are illustrated in Diana S. Waite, *Architectural Elements: The Technological Revolution* (New York: Bonanza Books, n.d.).

177. Information concerning the reconstruction of the lamp in front of Ford's Theatre was supplied by Henry A. Judd, Chief Historical Architect, National Park Service.

178. A photograph dated ca. 1890 of the Dundas-Lippincott Mansion at the northeast corner of Broad and Walnut Streets in Philadelphia shows one of the new type of gas street lamps on that corner, but a short distance from Broad Street on the south side of Walnut Street, one of the old type of lantern-form street lamps is clearly visible. The view is illustrated in Robert F. Looney, *Old Philadelphia in Early Photographs 1839-1914:215 Prints from the Collection of the Free Library of Philadelphia* (New York: Dover Publications, Inc., 1976), p. 174, plate 168.

179. Henry-Russell Hitchcock and William Seale, *Temples of Democracy: The State Capitols of the U.S.A.* (New York: Harcourt Brace Jovanovich, 1976), p. 119.

180. Walter H. Kilham, *Boston After Bulfinch, An Account of its Architecture, 1800-1900* (Cambridge: Harvard University Press, 1946), p. 51, plate 17.

181. Allan Nevins, ed., *The Diary of Philip Hone 1828-1851* (New York: Dodd, Mead and Company, 1936), p. 302.

[<<< Previous](#)

[<<< Contents >>>](#)

[Next >>>](#)

NATIONAL PARK SERVICE

Gaslighting in America
A Guide for Historic Preservation



BIBLIOGRAPHY

Astonishingly little has been written on the subject of gaslighting during the last 50 or 60 years. Compared with the amount of material published on lamps and candlesticks, the material on gas fixtures has been practically nil. It has, therefore, been necessary to include many rare and out-of-print books in this bibliography. This bibliography has been restricted to those works that proved most useful for research. Other publications of more peripheral interest have been included in the notes.

Accum, Fredrick. *A Practical Treatise, on Gas-Light, Exhibiting a Summary Description of the Apparatus and Machinery Best Calculated for Illuminating Streets, Houses, and Manufactories with Carburetted Hydrogen, or Coal-Gas; with Remarks on the Utility, Safety, and General Nature of this new Branch of Civil Economy*. London: R. Ackermanin, 1815.

This rare and handsomely illustrated work by Friedrich Christian Accum (1768-1838) is the first major publication on gaslighting in any language.

The American Gas-Light Journal, 1859—

This precursor of the *American Gas Journal* began publication on July 1, 1859, and is the most comprehensive source for technical reports on developments in its field starting from 1859.

Archer and Warner. *A Familiar Treatise on Candles, Lamps and Gas Lights; with Incidental Matters, Prepared for the Use of Their Customers, by Archer and Warner, Manufacturers of Gas Fixtures, Chandeliers, Lamps, Girandoles, &c.* Philadelphia,[1850].

This promotional pamphlet, not a catalogue, is perhaps the earliest extant publication by an American manufacturer of gas fixtures.

Artistic Houses, 2 vols. New York: D. Appleton and Company, 1883-1884.

This work contains many excellent views of American interiors of the post-Civil War era.

Benjamin, Park, ed. *Appletons' Cyclopaedia of Applied Mechanics: A Dictionary of Mechanical Engineering and Mechanical Arts*. New York: D. Appleton and Company, 1880.

Contains one of the best and most complete articles on gas technology of its period in any American publication.

Chandler, Dean. *Outline of History of Lighting by Gas*. [London, South Metropolitan Gas Company, 1936].

Technical and historical information on the development of gaslighting in Great Britain.

Cornelius and Baker. *Description of the Establishment of Cornelius and Baker*,

Manufacturers of Lamps, Chandeliers and Gas Fixtures, Philadelphia. Philadelphia: J.B. Chandler, 1860.

An important historical document; it describes the manufacturing processes of the firm in considerable detail.

Cornelius and Company. *Examples of Gas Fixtures and Other Metal Work for Ecclesiastical and Domestic Use. Designed after the Manner of Mediaeval Art Works by J. M. Beesley.* Philadelphia, [1877].

The only known copy of this work is catalogued in the Library of Congress but is presently missing.

Frank Leslie's Illustrated Newspaper, 1855—

This major weekly is a prime source for pictures of American interiors, particularly interiors of public buildings, and their lighting fixtures from 1855 to about the end of the gaslighting era.

Freedley, Edwin T. *Philadelphia and Its Manufactures: A Hand-Book Exhibiting the Development, Variety, and Statistics of the Manufacturing Industry of Philadelphia in 1857 Together with Sketches of Remarkable Manufactories; and a List of Articles Now Made in Philadelphia.* Philadelphia: Edward Young, 1859.

Contains detailed descriptions of Cornelius and Baker's manufacturing processes and shorter descriptions of Archer and Warner's operations.

Freeman, Larry. *New Light on Old Lamps.* Watkins Glen, N.Y.: Century House, 1968.

Contains useful illustrations from unidentified 1900 gas fixtures and glass catalogues.

Frink, I [saac]. P. *Frink's Patent Reflectors.* . . [New York, 1883].

This catalogue contains useful information on commercial and industrial (as well as some ecclesiastical) lighting during the 1870s and 1880s.

Gerhard, William Paul. *The American Practice of Gas Piping and Gas Lighting in Buildings.* New York: McGraw Publishing Company, 1908.

This is probably the best technical work on the subject published in America after 1900. It includes the Philadelphia rules for gasfitting, regarded as models for the whole country. Gerhard was a civil engineer and a corresponding member of the American Institute of Architects.

Greeley, Horace, et al. *The Great Industries of the United States: Being an Historical Summary of the Origin, Growth, and Perfection of the Chief Industrial Arts of this Country.* Hartford: J.B. Burr and Hyde, 1873.

Contains an excellent article about Cornelius and Sons.

Hale, Dean. "Diary of an Industry," *The American Gas Journal*, 1970. Unpaginated reprint. A useful chronological series of brief historical notes.

Harper's Weekly, 1857-ca. 1912

The comment following *Frank Leslie's Illustrated Newspaper* applies equally to *Harper's*

Weekly.

Humphreys, C. J. Russell. *Gas as a Source of Light, Heat and Power*. New York: A.M. Callender and Co, 1886.

An attractively designed and informative publication of the 1880s written for the layman. A clear, concise source of information.

Journal of the Franklin Institute of the State of Pennsylvania, for the Promotion of the Mechanic Arts. Devoted to Mechanical and Physical Science, Civil Engineering, the Arts and Manufactures, and the Record of Patent Inventions. Philadelphia: Franklin Institute, 1826.

The last words of the lengthy title, "Record of Patent Inventions," are the most significant in this context. The Franklin Institute Journal is, for the years before 1858, as important a source of technical information as is the *American Gas-Light Journal* for the years after 1859.

Kouwenhoven, John A. *The Columbia Historical Portrait of New York: An Essay in Graphic History in Honor of the Tricentennial of New York City and the Bicentennial of Columbia University*, Garden City, N.Y.: Doubleday and Company, Inc., 1953.

This excellent source, containing many interior views showing gas fixtures, has recently been reprinted in paperback.

Lancaster, Clay. *New York Interiors at the Turn of the Century in 131 Photographs by Joseph Byron from the Byron Collection of the Museum of the City of New York*. New York: Dover Publications, Inc., 1976.

At least 15 combination gas and electric fixtures, as well as older gas fixtures and numerous electroliers are shown in these photographs taken between 1893 and 1916. Plates 5 and 41 show lighted gas candles. As in Kouwenhoven, many nondomestic interiors are included in this useful visual source.

Larkin, James. *The Practical Brass and Iron Founder's Guide: A Concise Treatise of the Art of Brass Founding, Moulding, Etc. with Numerous Practical Rules, Tables, and Receipts for Gold, Silver, Tin, and Copper Founding; Plumbers, Bronze and Bell Founders, Jewellers, Etc.* Philadelphia: A. Hart, 1853.

Contains some "receipts" for brass finishes that were used during the 1850s.

McDonald, Donald. *Meters and Meter Makers: A Paper Prepared for the Fiftieth Anniversary Number of The American Gas-Light Journal July 19, 1911*. Albany, N.Y.: C.F. Williams and Son, [1911].

Probably the best historical account of American gasmeters and their manufacturers.

McHenry, John. *The Gas Meter and the Apparatus Used in the Manufacture of Coal Gas, Illustrated and Explained. Also Valuable Information Relative to Gas Fittings, Gas Burners and the Mode of Burning Gas, the Mode of Estimating the Illuminating Power of Gas, Naphthalized Gas, Ventilation of Gas Lights, the Illuminating Power of Gases, Comparison of Various Methods of Illuminating with Each Other The Cost of Manufacturing Gas at the Philadelphia and Louisville Gas Works, to Which is Added a Brief Sketch of the Early History and Progress of Gas Lighting in England, and Observations on the Generation of Illuminating Gas*, Cincinnati: J. Ernst, 1853.

The title says it all. This dull but useful work is a mine of information on American gas practice at mid-century.

McKenney and Waterbury Company. *Gas Catalogue G*. Boston, [n.d.].

A typical as well as handsome and illustrative example of the many American catalogues dating from ca. 1900.

Metropolitan Museum of Art. *19th-Century America—Furniture and Decorative Arts: An Exhibition in Celebration of the Hundredth Anniversary of the Metropolitan Museum of Art, April 16 through September 7, 1970*. New York: New York Graphic Society, Ltd., 1970.

Contains illustrations of and data on eight gas fixtures of high quality.

Metropolitan Museum of Art. Print Room, Elisha Whittlesey Fund 51.533 [Archer and Pancoast Manufacturing Co.]

These 110 chromolithographed plates excellently illustrate this company's best products during the 1870s.

Mitchell, Vance and Company. *Centennial Catalogue of Chandeliers, Gas Fixtures, Bronze Ornaments, Clocks, Etc.* New York, 1876.

Although it has comparatively few illustrations (wood engravings, not lithographs), this catalogue contains valuable information about the firm, as well as a significant list of references.

Peckston, Thomas S. *A Practical Treatise on Gas-Lighting in Which the Gas Apparatus Generally in Use is Explained and Illustrated by Twenty-two Appropriate Plates*. London: Herbert, 1841.

Contains the latest technical information at the time when gaslighting was on the threshold of its first real popularity in America. This English work is, as the title says, "appropriately illustrated."

Peterson, Charles E. ed. *Building Early America: Contributions Toward the History of a Great Industry*. Radnor, Pennsylvania: Chilton Book Company, 1976. Chapter 11, "Early Nineteenth-Century Lighting" by Loris S. Russell.

Contains a brief but recently written sketch of gaslighting.

Peterson, Harold. *Americans at Home From the Colonists to the Late Victorians*. New York: Charles Scribner's Sons, 1971.

Contains numerous interior views showing gas fixtures, some of great interest.

Philadelphia Museum of Art. *Philadelphia: Three Centuries of American Art, Bicentennial Exhibition April 11-October 10, 1976*. Philadelphia: Philadelphia Museum of Art, 1976.

Contains excellent entries on Robert Cornelius, the artist designer John Henry Frederick Sachse, and two Cornelius fixtures.

Poor Richard's Gas Catechism for the People. Springfield, Massachusetts, 1870.

A compendium of useful information for the layman in question and answer form. An entertaining period piece of promotional propaganda.

Pyne Press. *Lamps and Other Lighting Devices 1850-1906*. Princeton: The Pyne Press. 1972.

This work emphasizes lamps, but it fully reproduces the Cornelius and Sons catalogue of ca. 1876. in the Historical Society of Pennsylvania. A useful excerpt from Archer and Warner's *Familiar Treatise* is also included.

Romaine, Lawrence B. *A Guide to American Trade Catalogs 1744-1900*. New York: R.R. Bowker Company, 1960.

Somewhat outdated, this book remains an indispensable source for finding catalogues.

Russell, Loris S. *A Heritage of Light, Lamps and Lighting in the Early Canadian Home*. Toronto: University of Toronto Press, 1968.

Although its subject is Canadian lighting, many of the examples cited were made in the United States. This is one of the few relatively recent works to mention gaslighting at all.

Seale, William. *The Tasteful Interlude: American Interiors through the Camera's Eye, 1860-1917*. New York: Praeger Publishers, 1975.

As far as views of American domestic interiors are concerned, this book does for the later 19th century what Peterson's book does for the entire century. Together with Kouwenhoven's *Columbia Historical Portrait*, Lancaster's *New York Interiors*, and Peterson's *Americans at home*, Seale's *Tasteful Interlude* is one of the four best collections of interior views showing contemporary installations of gas fixtures.

Starr, Fellows and Company. *Starr, Fellows and Company's Illustrated Catalogue of Lamps, Gas Fixtures, &c.* [New York] 1856.

This major document is the first American gas fixture catalogue so far discovered in complete form.

Wainwright, Nicholas B. *Philadelphia in the Romantic Age of Lithography: An Illustrated History of Early Lithography in Philadelphia with a Descriptive List of Philadelphia Scenes Made by Philadelphia Lithographers Before 1866*. Philadelphia: Historical Society of Pennsylvania, 1958.

Contains some excellent views of shop interiors during the 1850s.

Walter, Thomas U [stick] and Smith, J. Jay. *A Guide to Workers in Metal and Stone: For the Use of Architects and Designers, Black and White Smiths, Brass Founders, Gas Fitters, Iron Masters, Plumbers, Silver and Goldsmiths, Stove and Furnace Manufacturers, Pattern Makers, Marble Masons, Stucco Workers, Carvers and Ornamental Workers in Wood, Potters, Etc. From Original Designs and Selections Made from Every Accessible Source, American and European*. Philadelphia: Carey and Hart, 1846.

Most of the gaslights shown in this work are exterior fixtures of English design, but plate 17 is the earliest illustration of American gas fixtures (by Cornelius) presently known.

Warner, Miskey and Merrill. *Patterns*. Philadelphia: P.S. Duval and Son, [1859].

Washington, D.C., Library of Congress, Lot 2728. Division of Prints and Photographs.

Group of 69 British engravings of gas fixtures dates from 1820-1830 and is probably the oldest collection of such illustrations still extant.

Washington, D.C., National Archives, Record Group 77.

Records of the Office of the Chief of Engineers, Fortifications File, 1776-1920. Thackera Sons and Company.

The best group of illustrations of American gas fixtures ca. 1880 that has so far been discovered.

Watkins, C. Malcolm. "Artificial Lighting in America: 1830-1860." *Annual Report of the Regents of the Smithsonian Institution Showing the Operations, Expenditures, and Condition of the Institution for the Year Ended June 30, 1951*. Washington, U.S. Government Printing Office, 1952, pp. 385-407.

A pioneering article with a brief discussion of gaslight.

Webster, T [homas] and Parkes, Mrs. [Frances Byerley]. *An Encyclopaedia of Domestic Economy: Comprising Subjects Connected with the Interests of Every Individual; Such as the Construction of Domestic Edifices; Furniture; Carriages, and Instruments of Domestic Use. Also, Animal and Vegetable Substances Uses as Food, and the Methods of Preserving and Preparing Them by Cooking; Receipts, Etc. Materials Employed in Dress and the Toilet; Business of the Laundry; Preservation of Health; Domestic Medicines, &c.* New York: Harper and Brothers, 1849.

Thomas Webster's *Encyclopaedia* was first published in London in 1844, and this 1849 American edition was entered according to an Act of Congress in 1845. This work is by no means as superficial as the title page seems to suggest. Book four, titled "Artificial Illumination," is well illustrated with British lighting devices, and chapter five of this book, "Illumination by Means of Gas," (pp. 198-206) is an excellent early article on the subject.

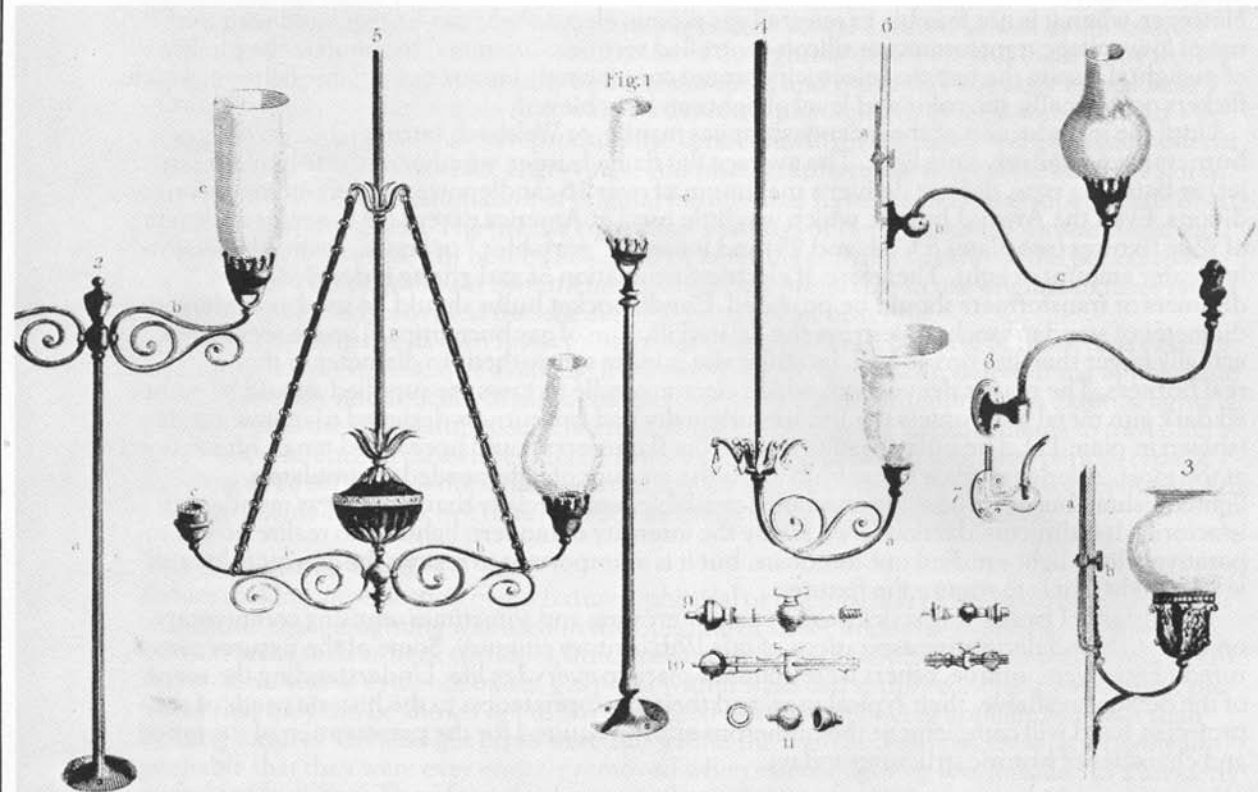
Yorke, Eugene H. *The Essential Facts in Lighting with Kerosene, Electricity, Gas*. [n.p.], 1890. An entertaining promotional brochure favoring gas written for laymen.

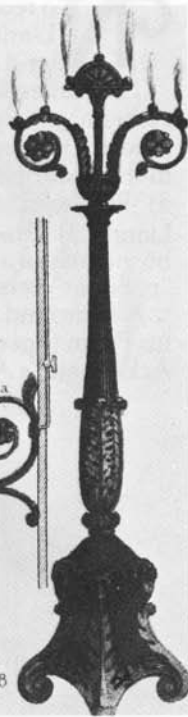
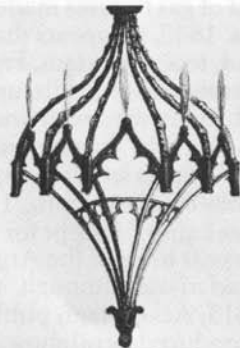
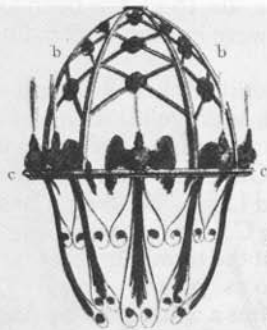
<<< [Previous](#)

<<< [Contents](#) >>>



Fig 1







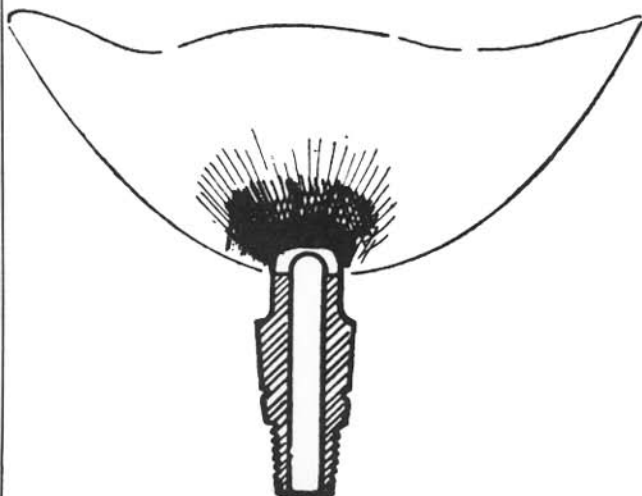
Rat-tail 1808.



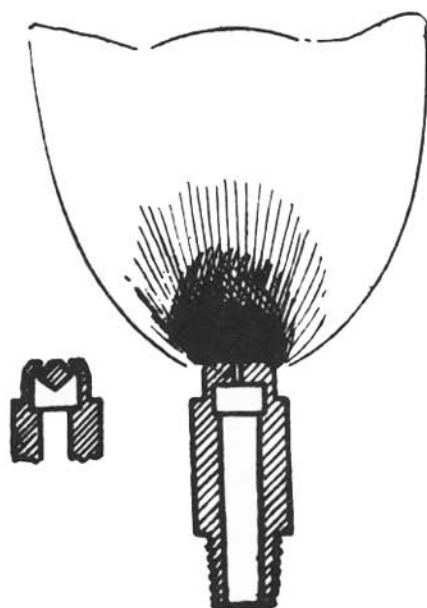
Cockspur 1808



Cockscomb 1808.



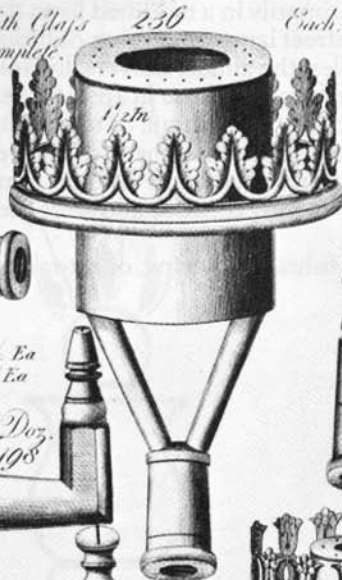
Batwing 1816.



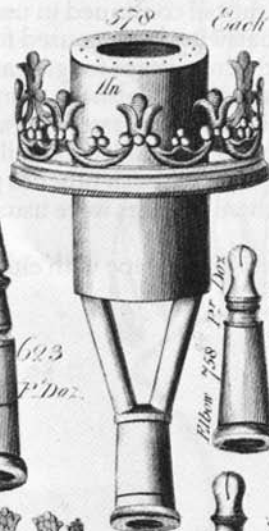
Fishtail 1820.



Each with Glass Holders complete.

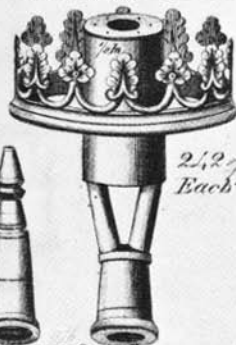


Each.



Each

A size less than N^o 230 say 1 1/4 in diam }
of light with 21 holes in N^o 830 } 1/2 Ea
D^o — D^o — Elbow — 831 1/4 Ea



2 1/2 1/4
Each



759 1/2 Doz

Elbow 760 1/2 Doz



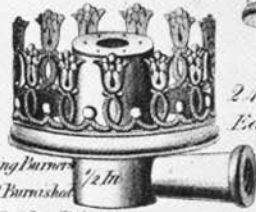
1 1/2 Doz
198

1 1/2 Doz
196

W. J. & B. Gas Burners
for Streets, not Burnished
Straight — Elbow — 1/2 In
&c. May be had at less Prices, say
Straight — Elbow — 1/2 Doz — less



623
1/2 Doz



2 1/2 1/4
Each



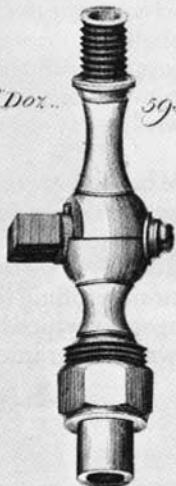
623
1/2 Doz



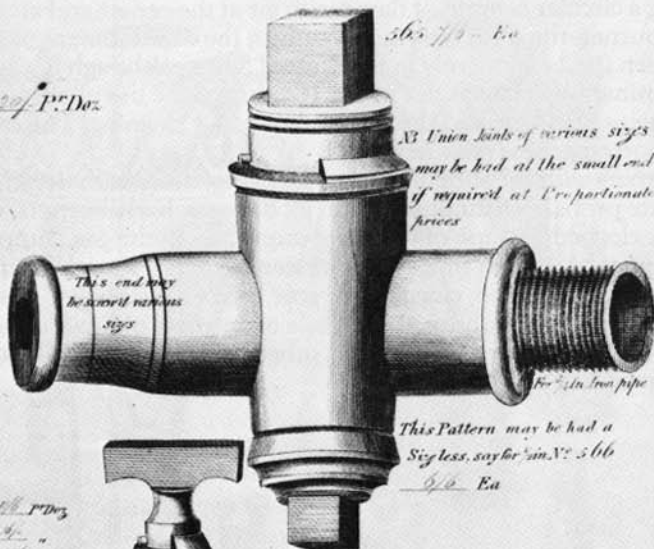
1 1/2 Doz



622 $\frac{1}{4}$ " P^r Doz.



595 $\frac{3}{4}$ " P^r Doz.



565 $\frac{1}{2}$ " - Ea

All Union Joints of various sizes
may be had at the small end
if required at proportionate
prices

This end may
be screw'd various
sizes

for $\frac{1}{2}$ " in iron pipe

This Pattern may be had a
Size less, say for $\frac{1}{2}$ " in No 566
 $\frac{1}{2}$ " Ea

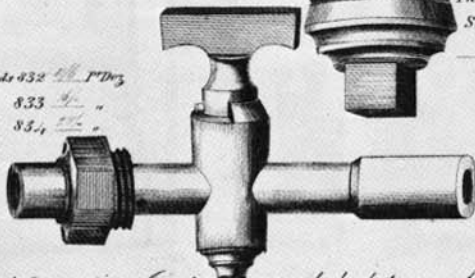
This Cock
may be screw'd
with a rough
thread for small iron
pipe if required



694

$\frac{1}{4}$ " P^r Doz

$\frac{3}{4}$ " at both ends 532 $\frac{1}{2}$ " P^r Doz
 $\frac{1}{4}$ " " " 533 $\frac{1}{4}$ " " "
 $\frac{3}{4}$ " " " 534 $\frac{3}{4}$ " " "

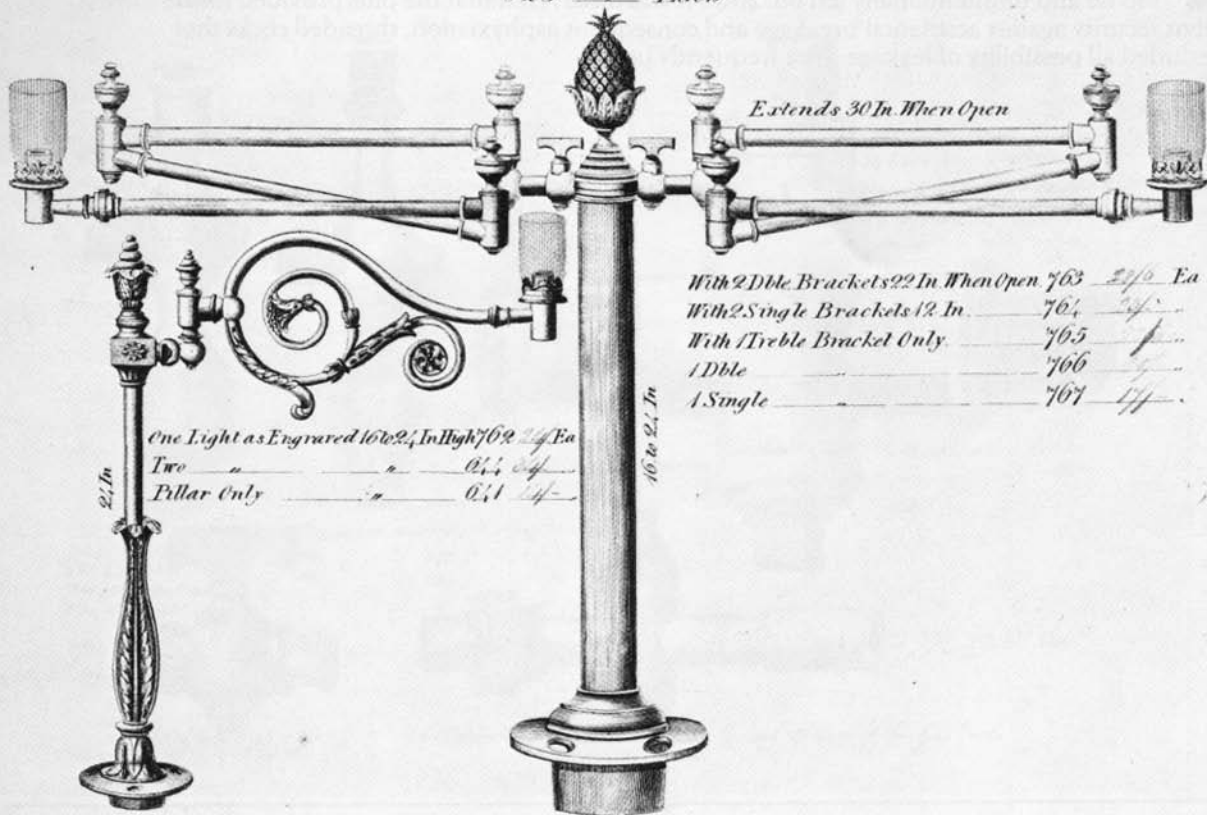


577 $\frac{1}{2}$ " P^r Doz

$\frac{5}{8}$ to $\frac{3}{4}$ " in $\frac{1}{2}$ " P^r Doz
 $\frac{3}{4}$ to $\frac{1}{2}$ " in $\frac{1}{2}$ " P^r Doz

A Connecting Joint may be had to any of the Gas Cocks

625 ⁵⁴/₁₀₀ Each



Extends 30 In. When Open

With 2 Dble Brackets 22 In. When Open.	763	²⁴ / ₁₀₀ Ea
With 2 Single Brackets 12 In.	764	²⁴ / ₁₀₀
With 1 Treble Bracket Only.	765	²⁴ / ₁₀₀
1 Dble	766	²⁴ / ₁₀₀
1 Single	767	²⁴ / ₁₀₀

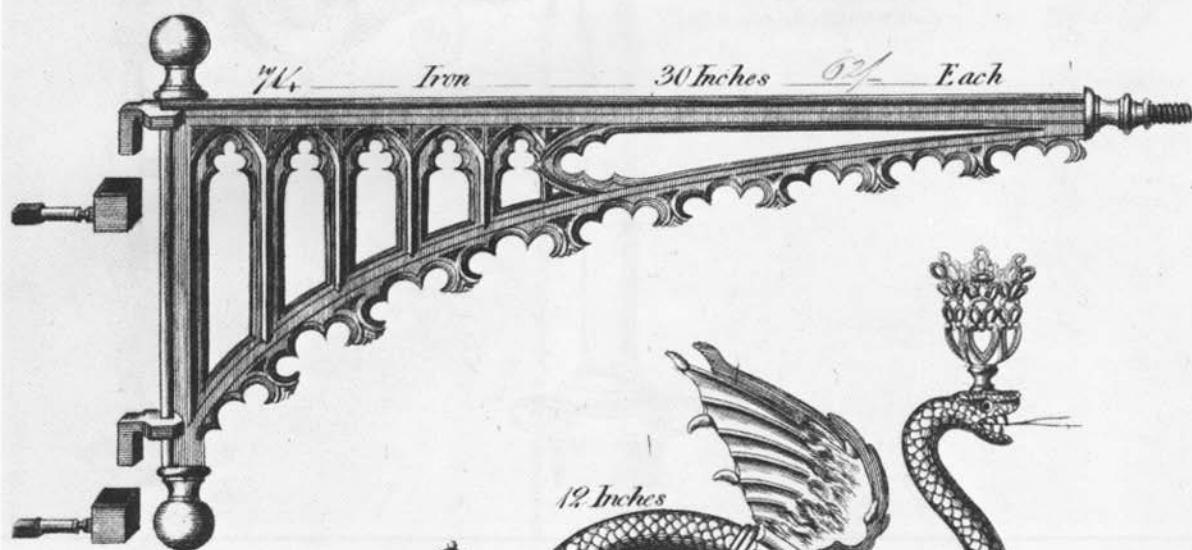
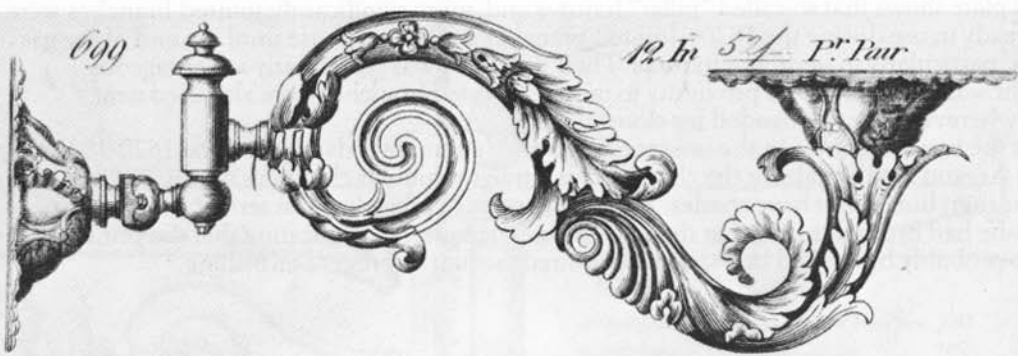
One Light as Engraved 16 to 24 In. High 702 ²⁴/₁₀₀ Ea

Two " " " 704 ²⁴/₁₀₀

Pillar Only " " 704 ²⁴/₁₀₀

24 In

16 to 24 In



753 may be had any number
of Lights at 21/- Pth Light extra

18In Bracket to match 753
is 840 42/- Pth Pair

1 Light Pendant to match

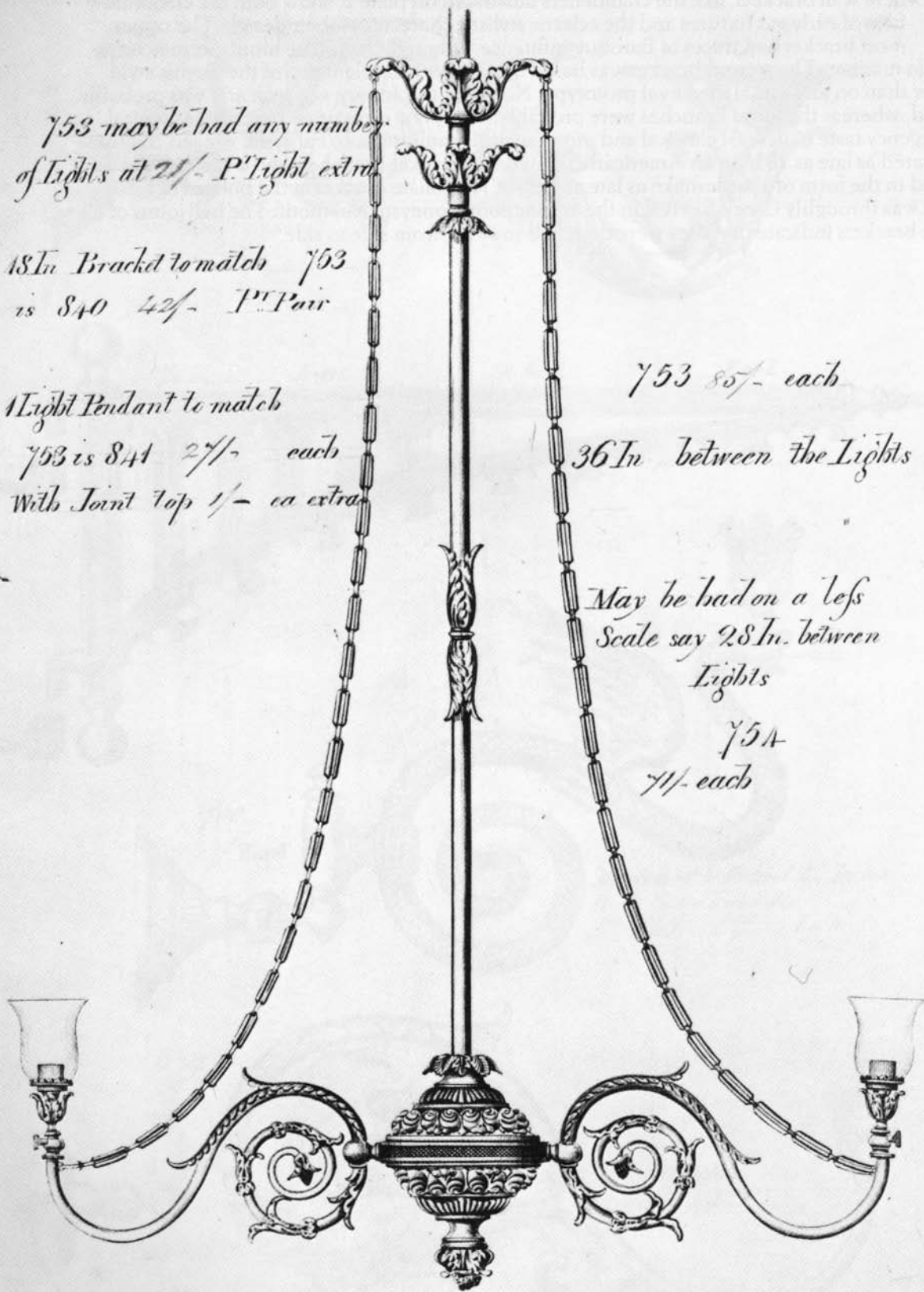
753 is 841 21/- each
With Joint Top 1/- ea extra

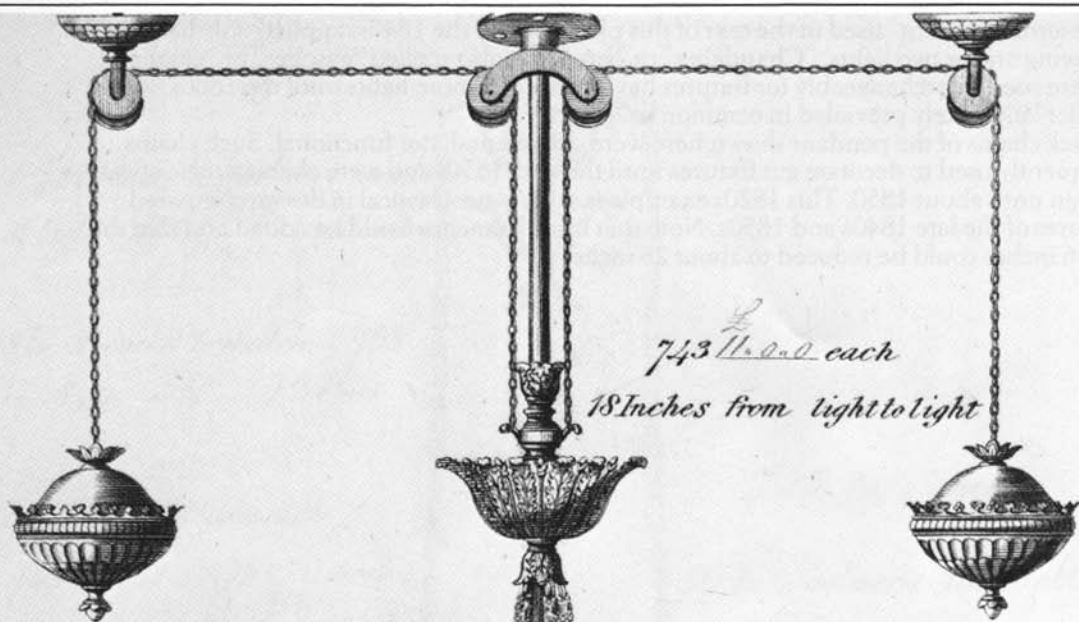
753 80/- each

36In between the Lights

May be had on a less
Scale say 28In. between
Lights

754
71/- each





743 ^L11.0.0 each
18 Inches from light to light

Without the sliding apparatus
744 ^L9.0.0 each

Without the glass dish
25/- each less

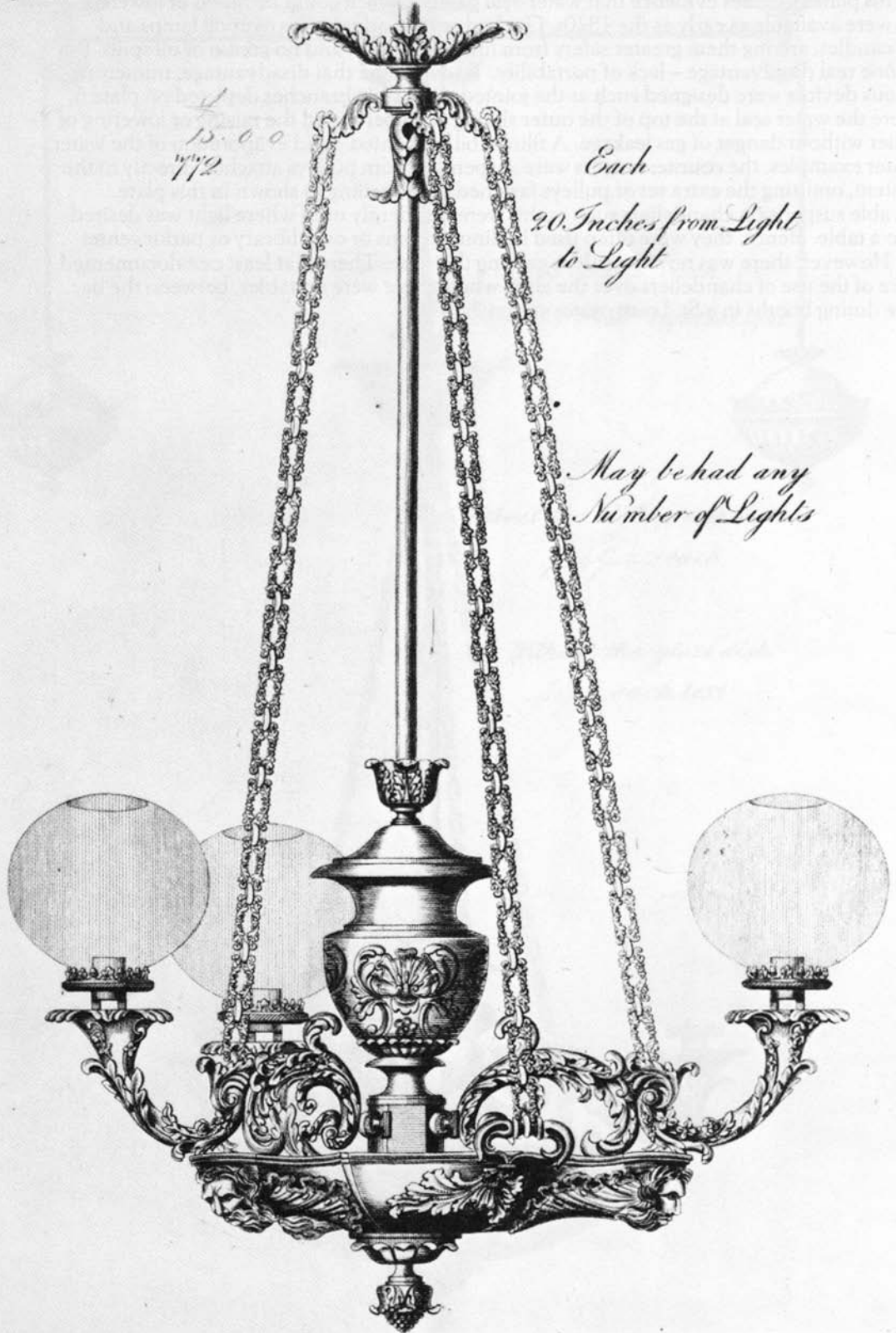


15.00
772

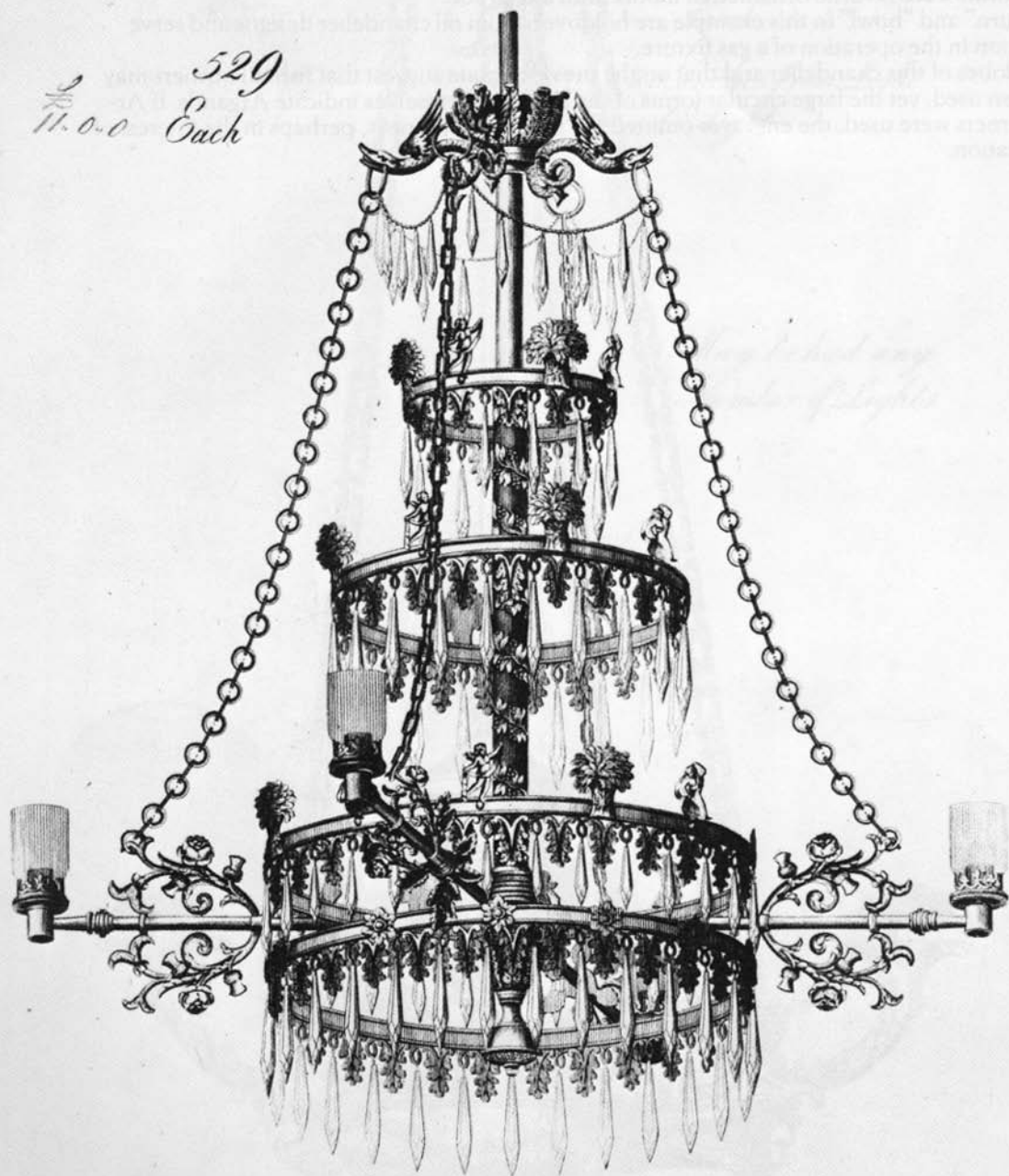
Each

20. Inches from Light
to Light

May be had any
Number of Lights

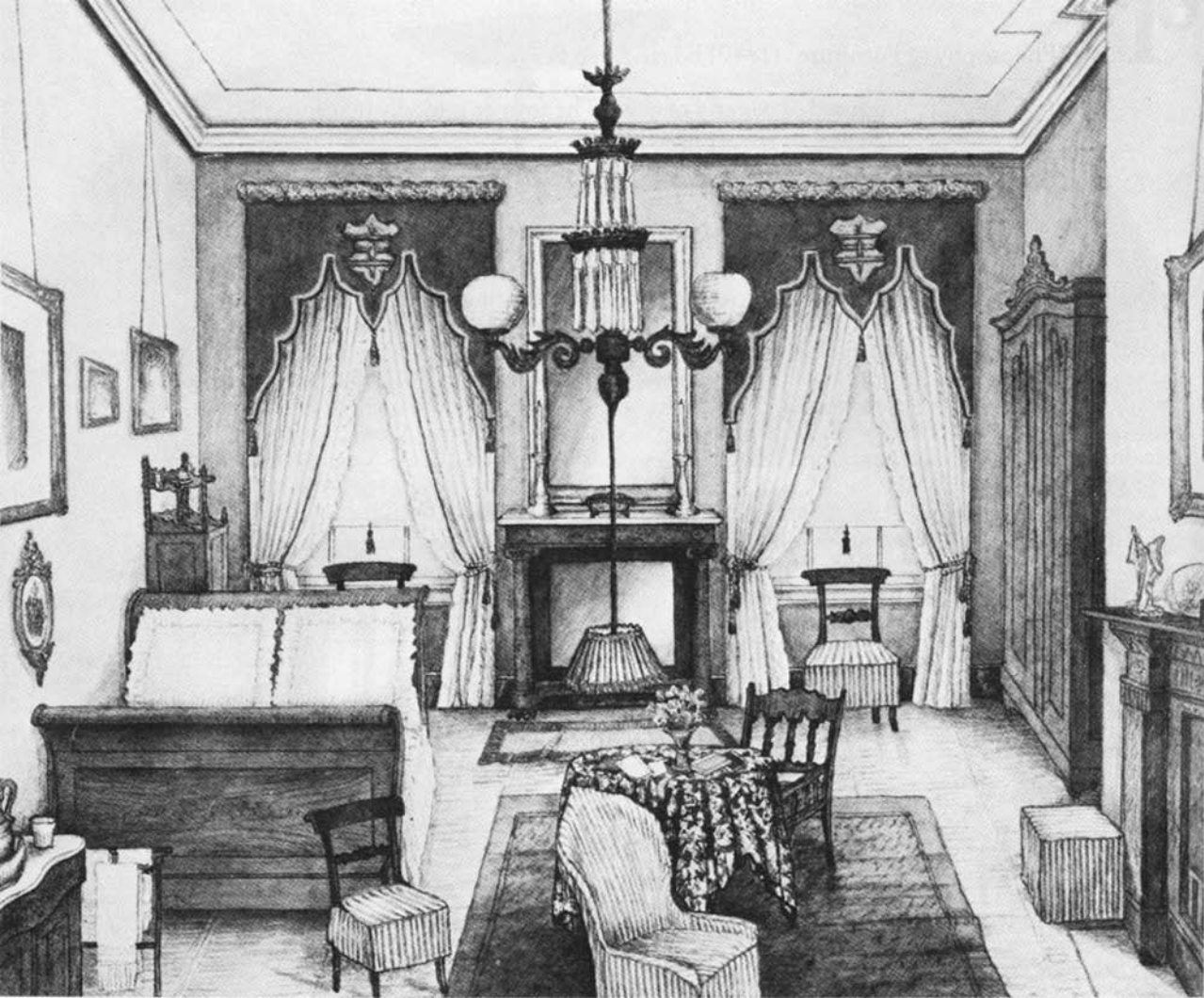


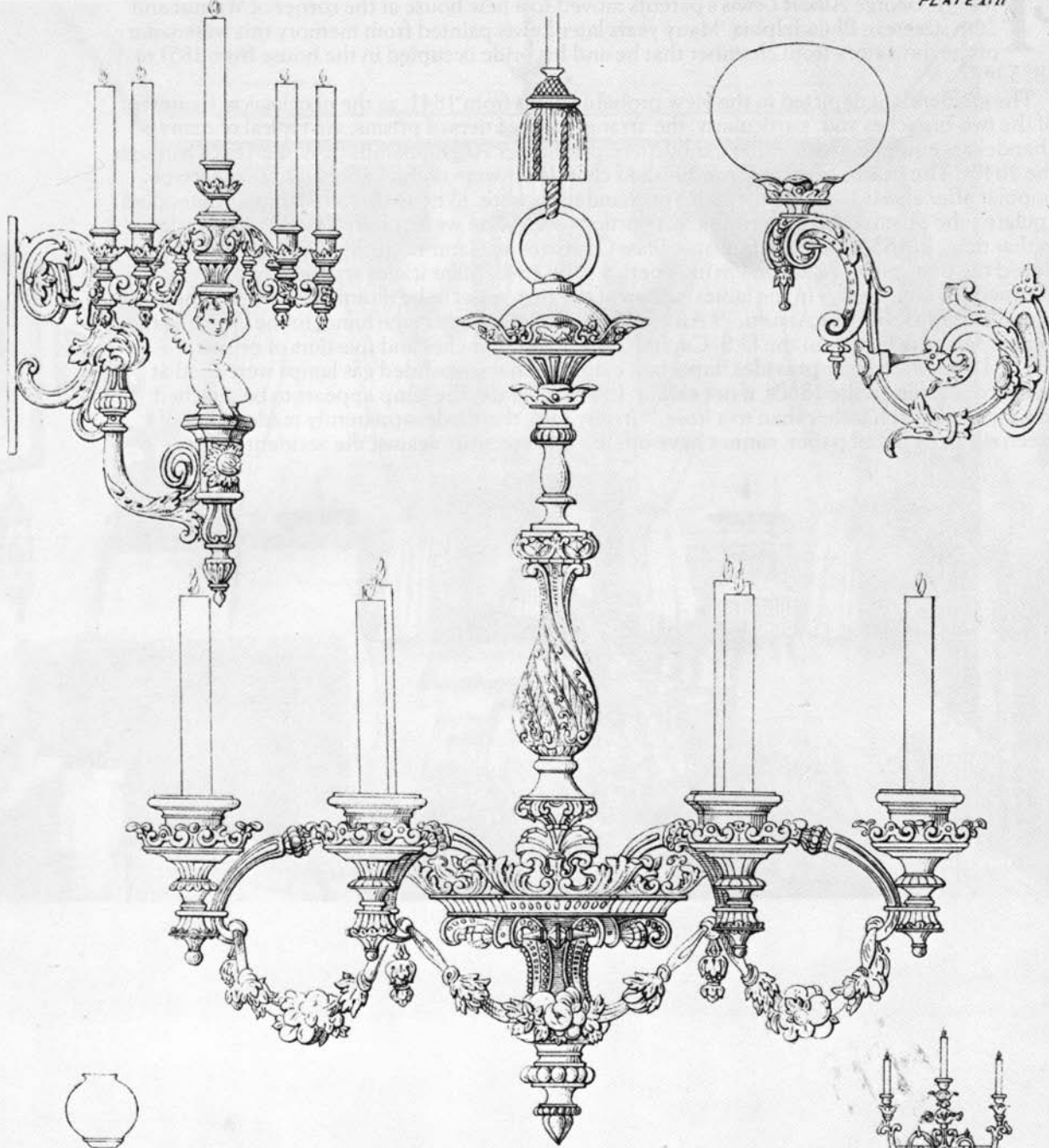
529
L.O.O. Each







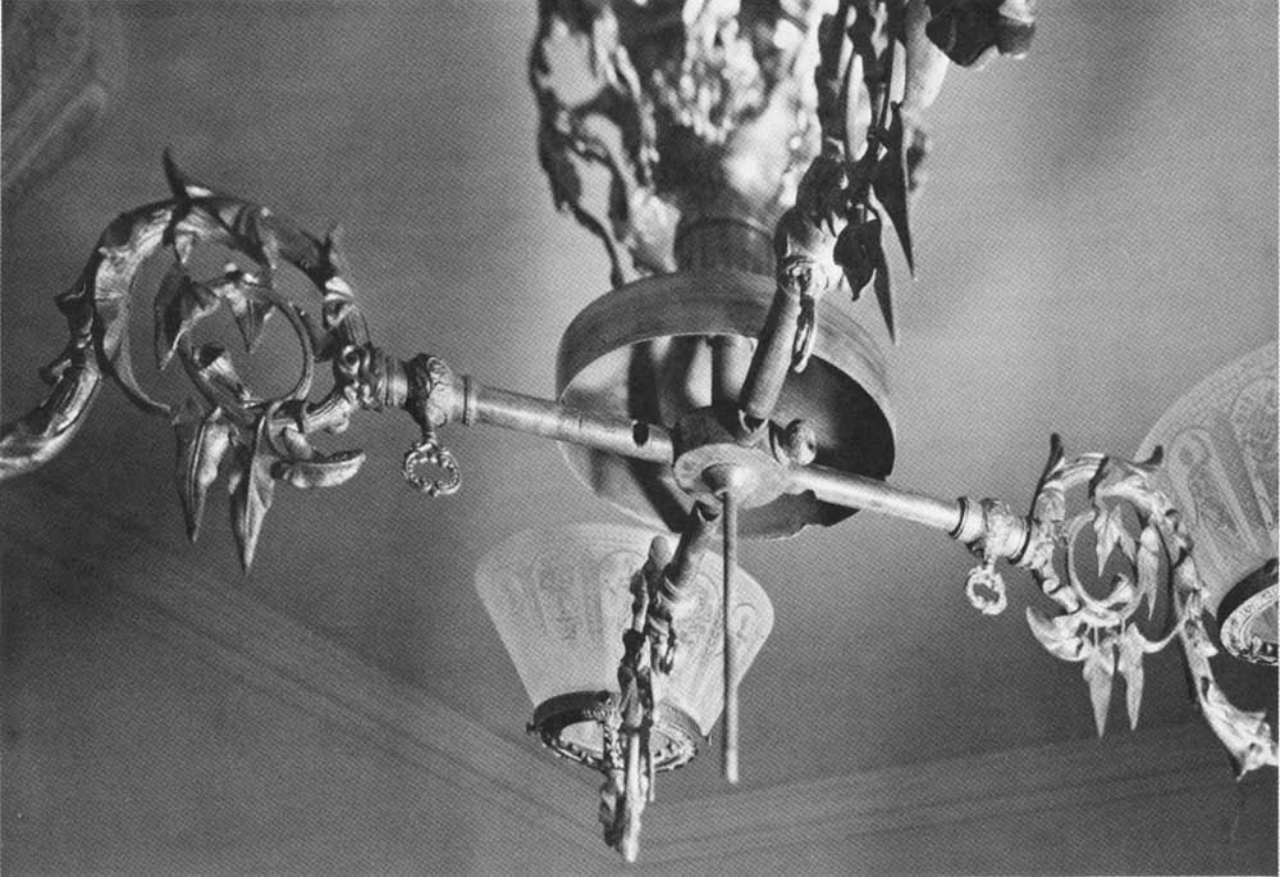




*Gas Fittings.
 Executed by
 Cornelius and Son
 Philadelphia.*

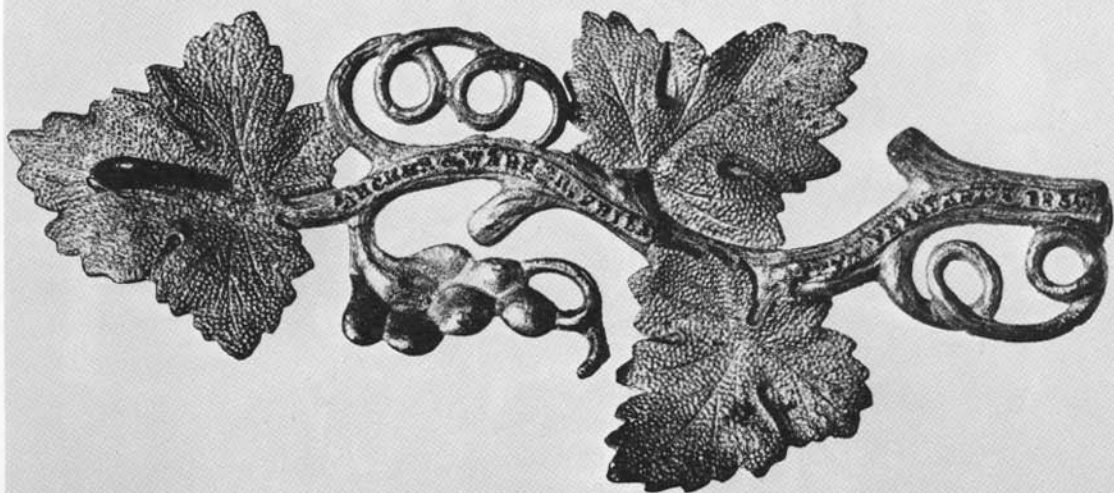
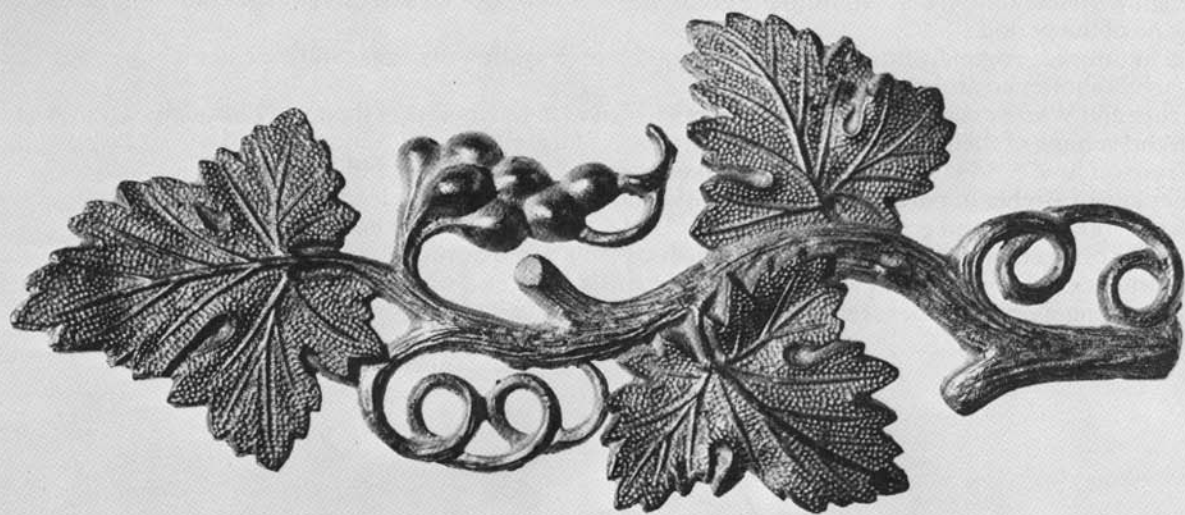






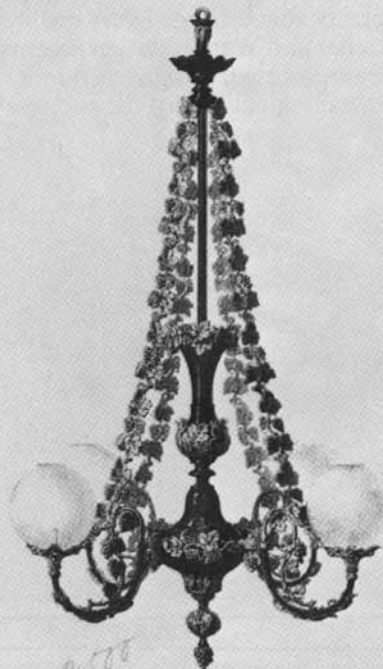






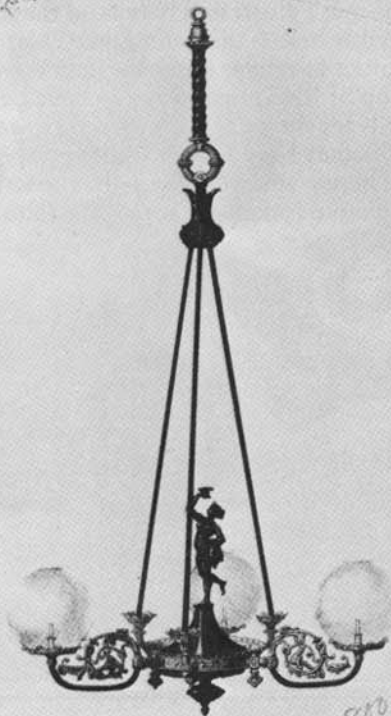
ARCHER, WARNER,
MISKEY & CO

PLAS



12576

4 light 3286



3 light 4228

1870

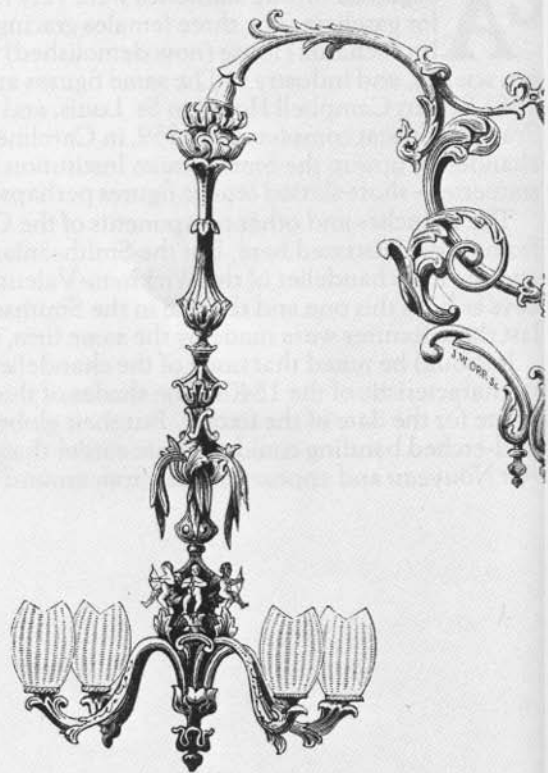
CHANDELIERS

Made & Printed in Colors by T.S. Brown & Son, Phila.

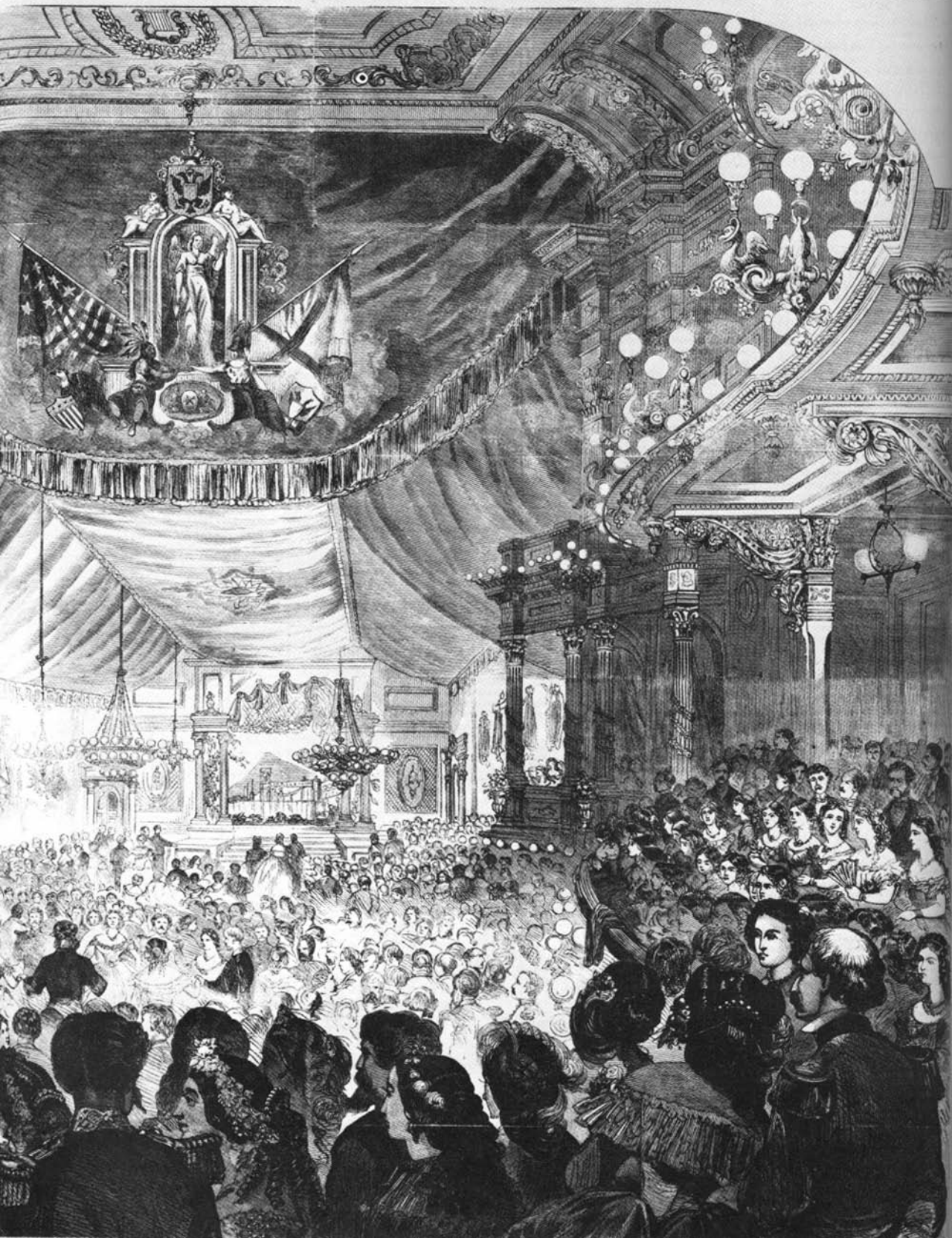


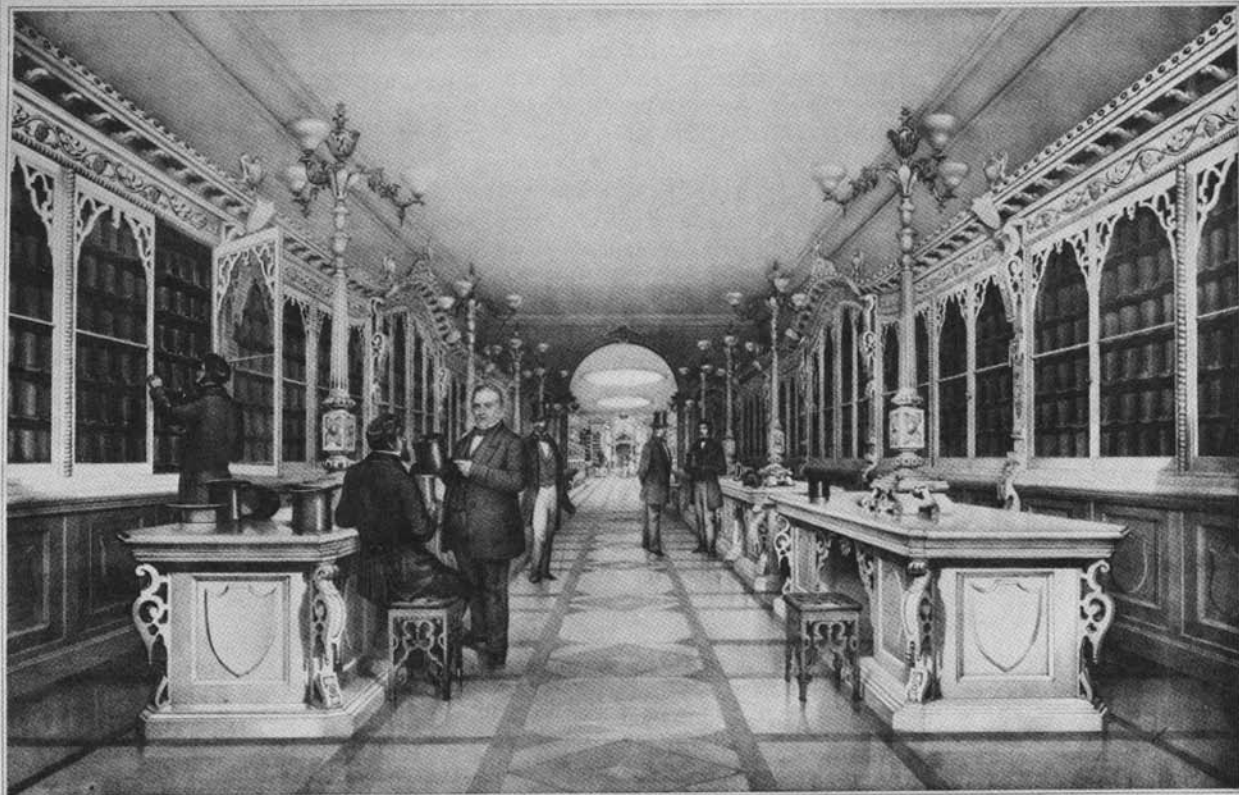












CHARLES OAKFORD'S MODEL HAT STORE.

..... 158, Chestnut Street, Philadelphia

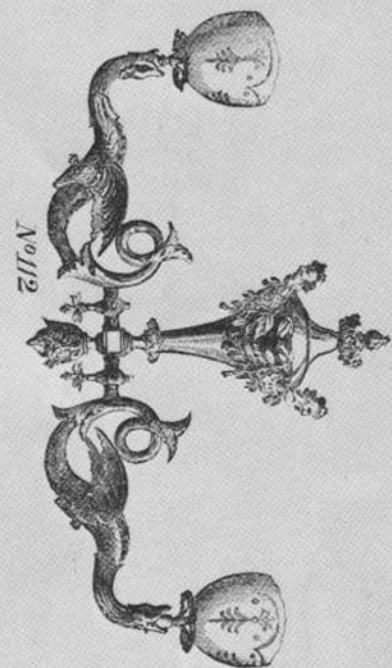
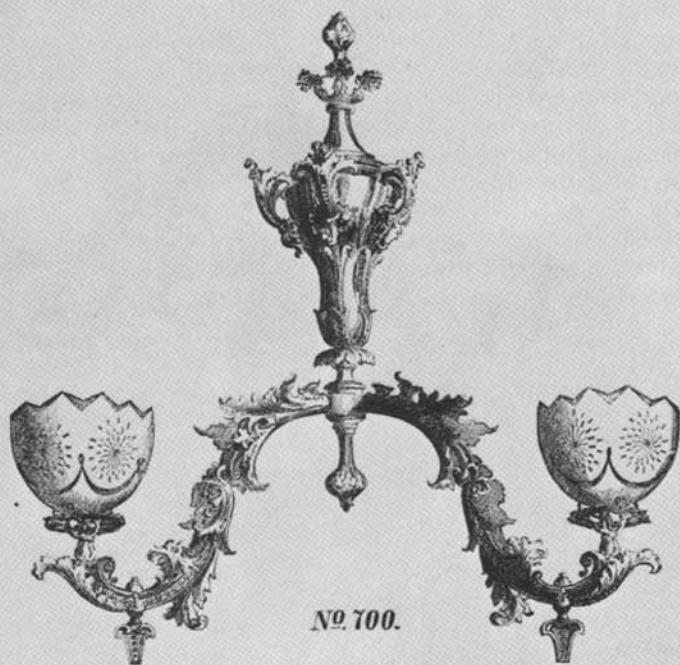
HATS, CAPS & FURS, WHOLESALE & RETAIL.

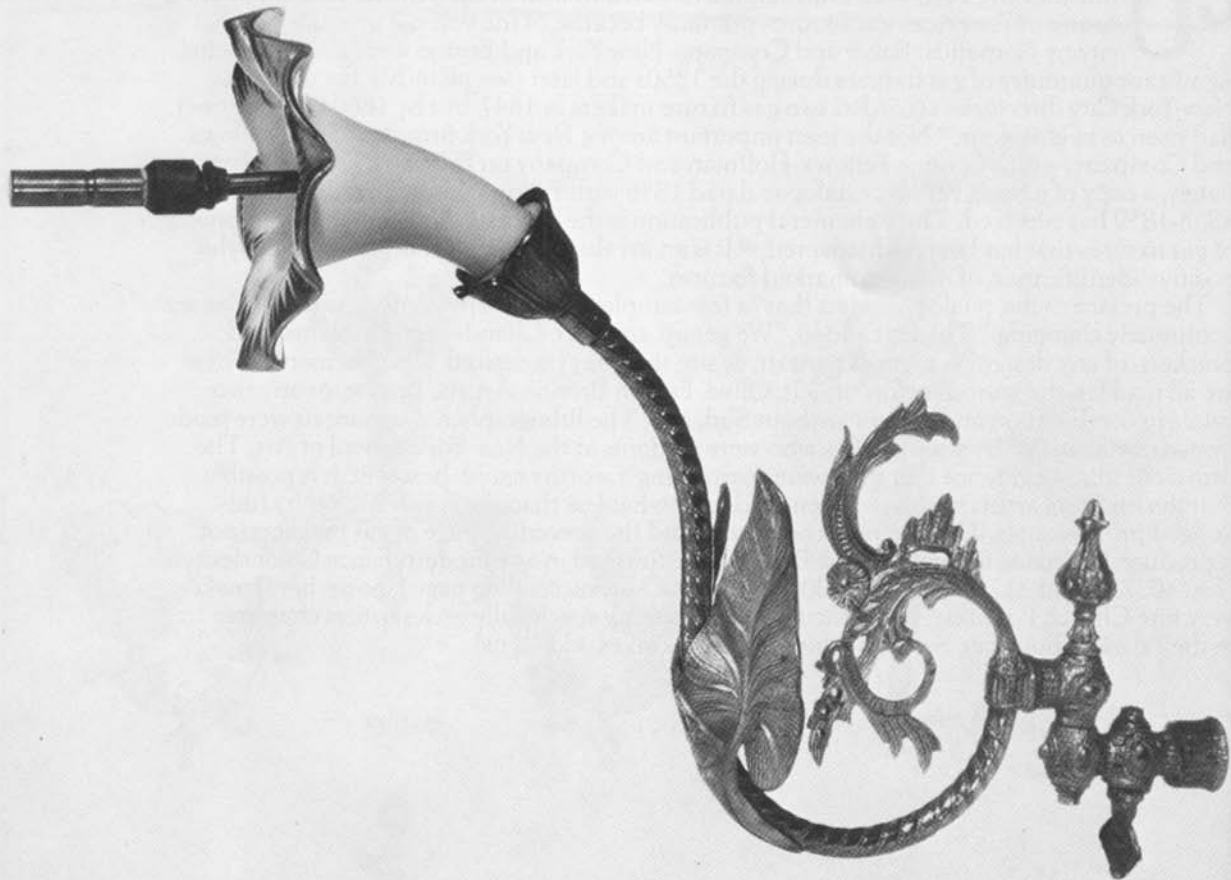


GREAT FAIR GIVEN AT THE CITY ASSEMBLY ROOMS, NEW YORK, DECEMBER, 1851.

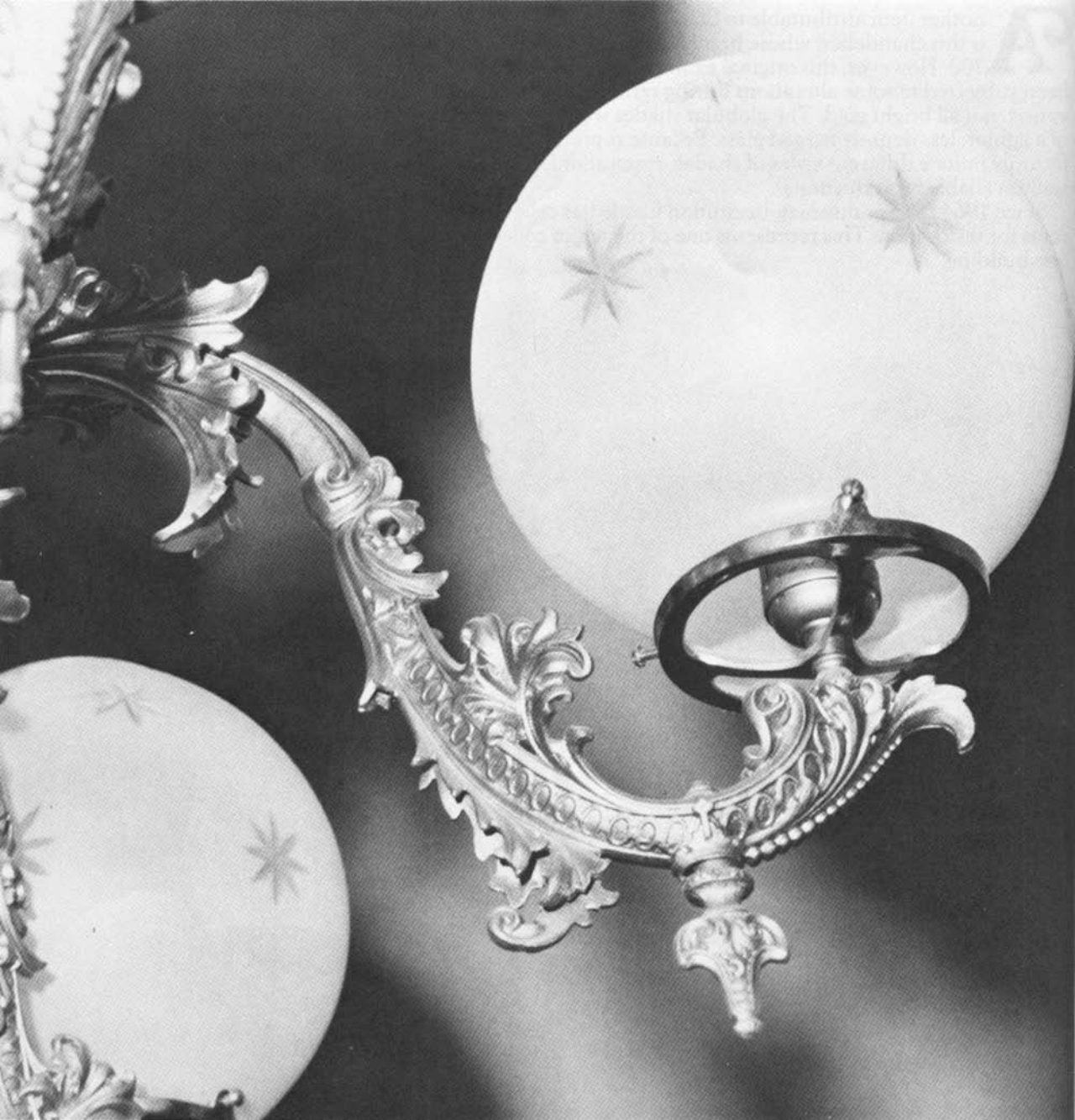


GAS BRACKETS.

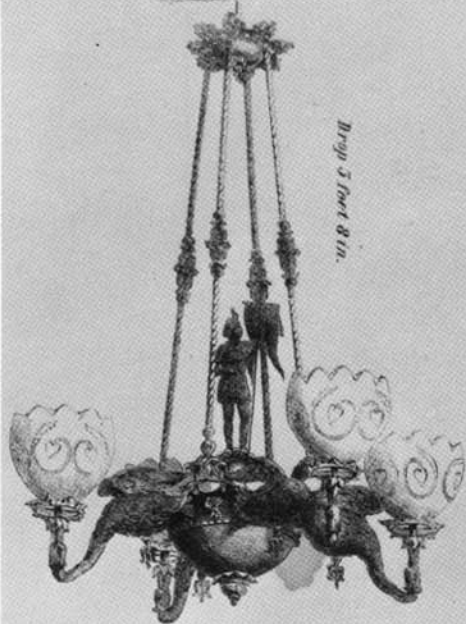






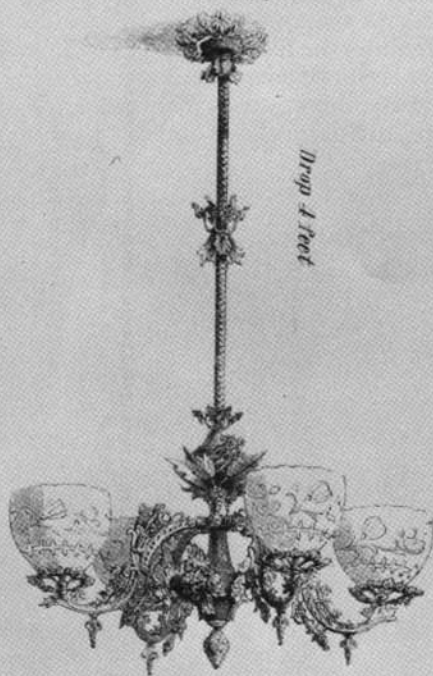


N^o 80

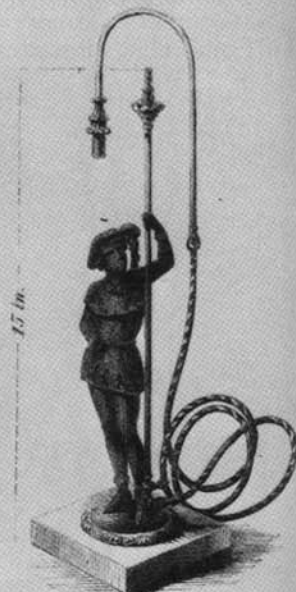


Drop 3 feet 8 in.

N^o 594

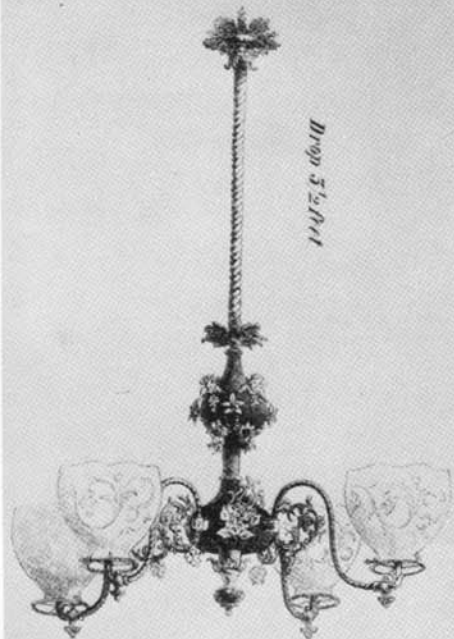


Drop 4 feet



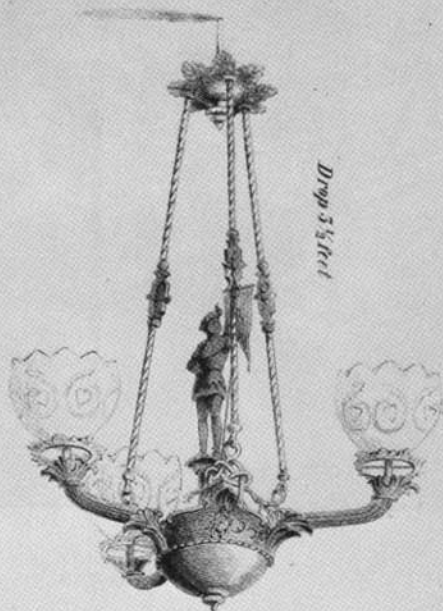
Drop 5 feet

N^o 557



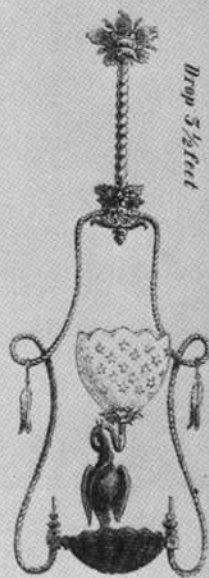
Drop 3 1/2 feet

N^o 78



Drop 3 1/2 feet

N^o 151



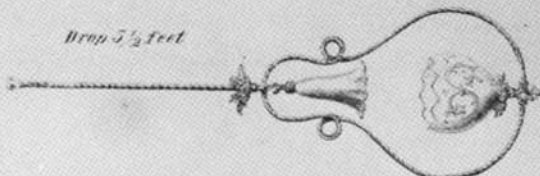
Drop 3 1/2 feet

N^o 22



Drop 3 1/2 feet

N^o 127

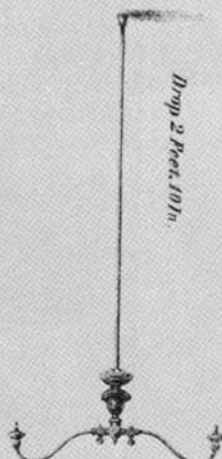






SPRING GAS STAND.

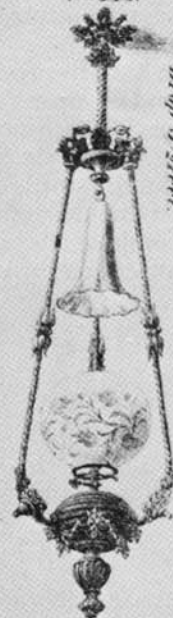
N^o 5



Drop 2 Feet 10 In.

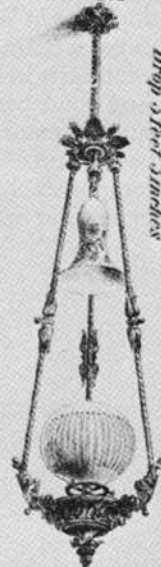
Spread 1 Ft. 4 In.

N^o 149



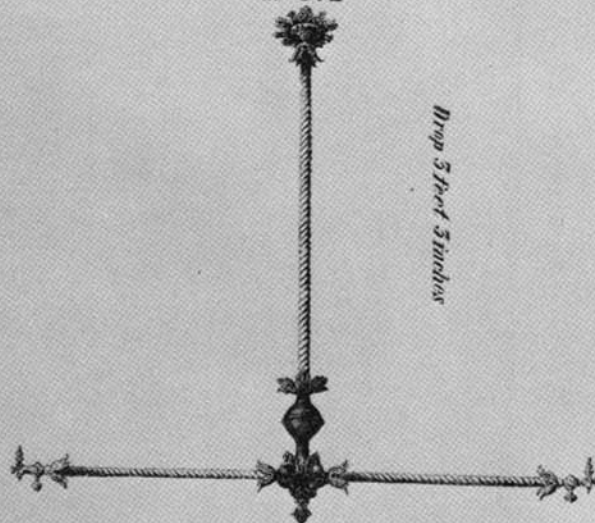
Drop 5 1/2 Feet.

N^o 151



Drop 5 Feet 5 inches

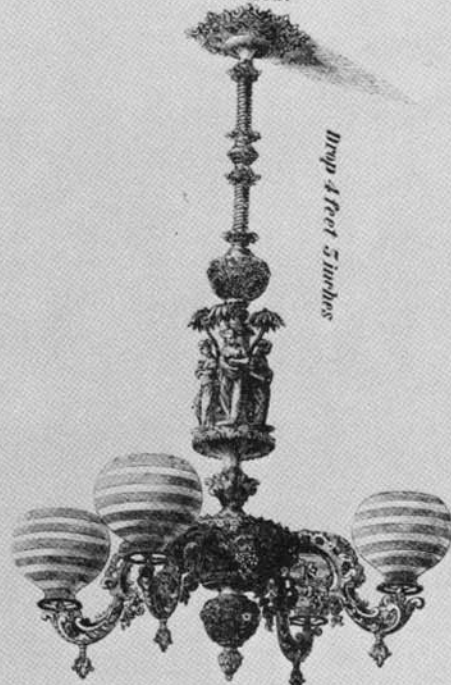
N^o 172



Drop 5 Feet 3 inches

Spread 5 feet 8 inches

N^o 103.

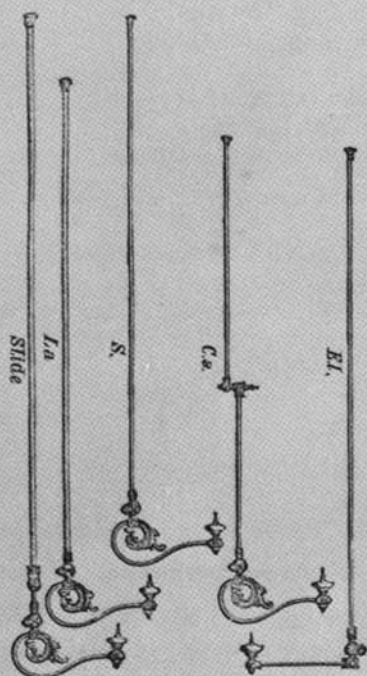


Drop 4 feet 5 inches

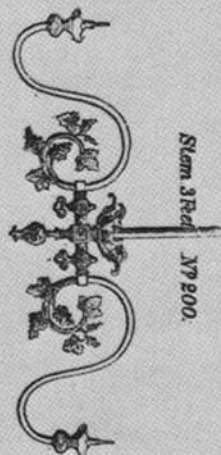
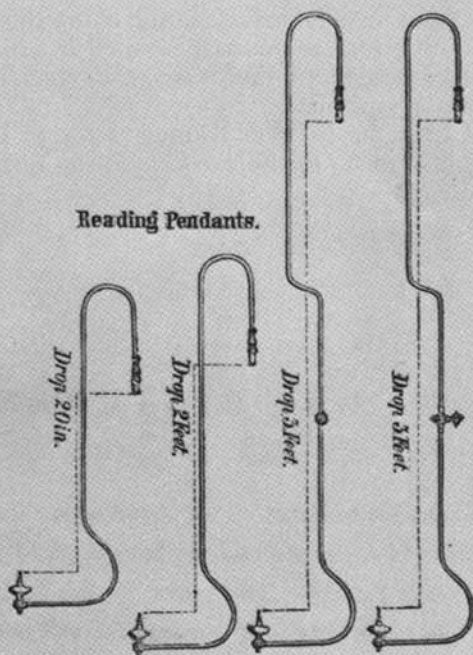
Spread 2 feet 5 inches



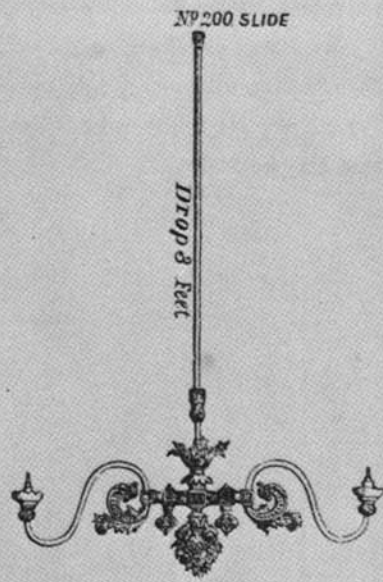
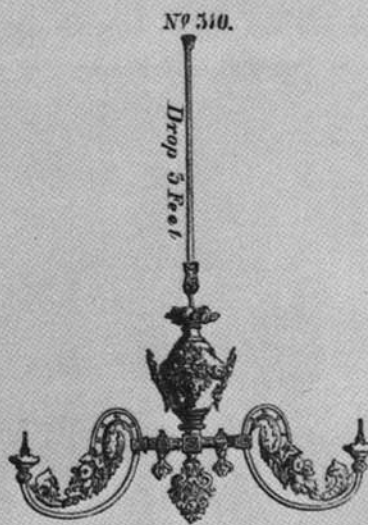
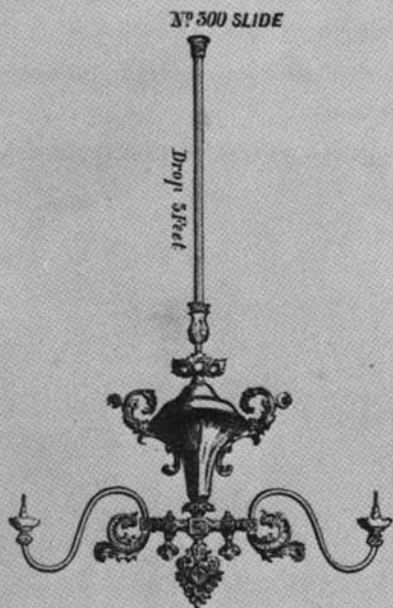
GAS PENDANTS.



Reading Pendants.

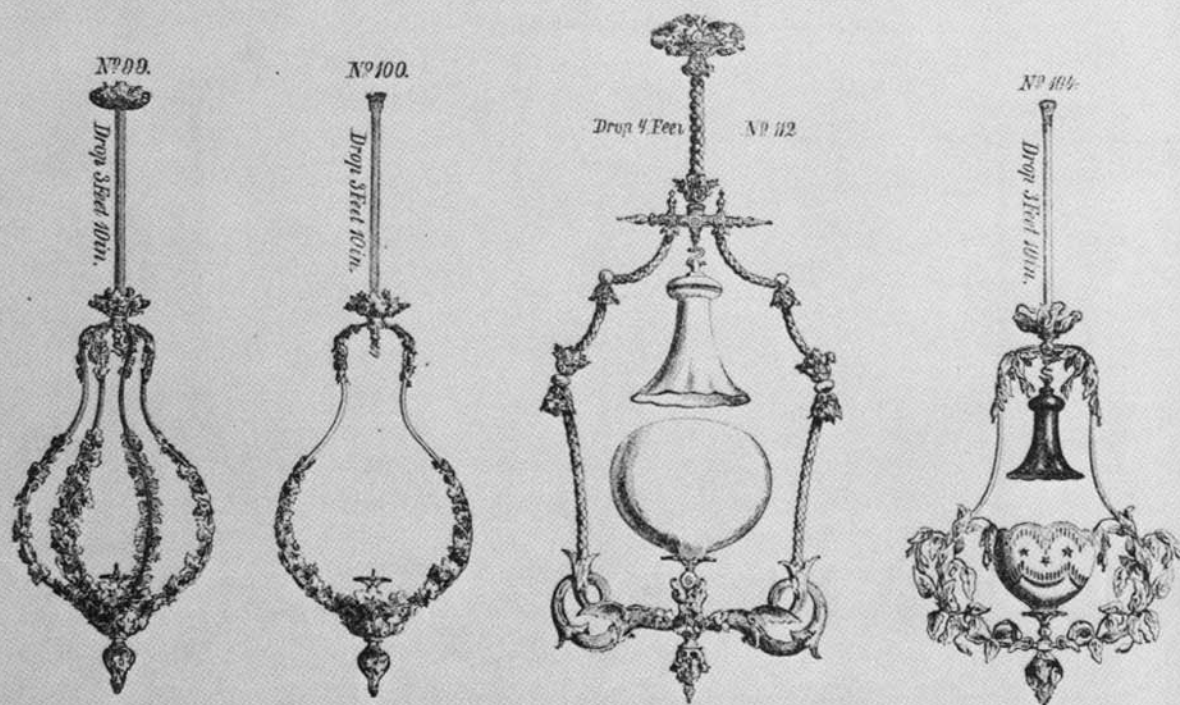
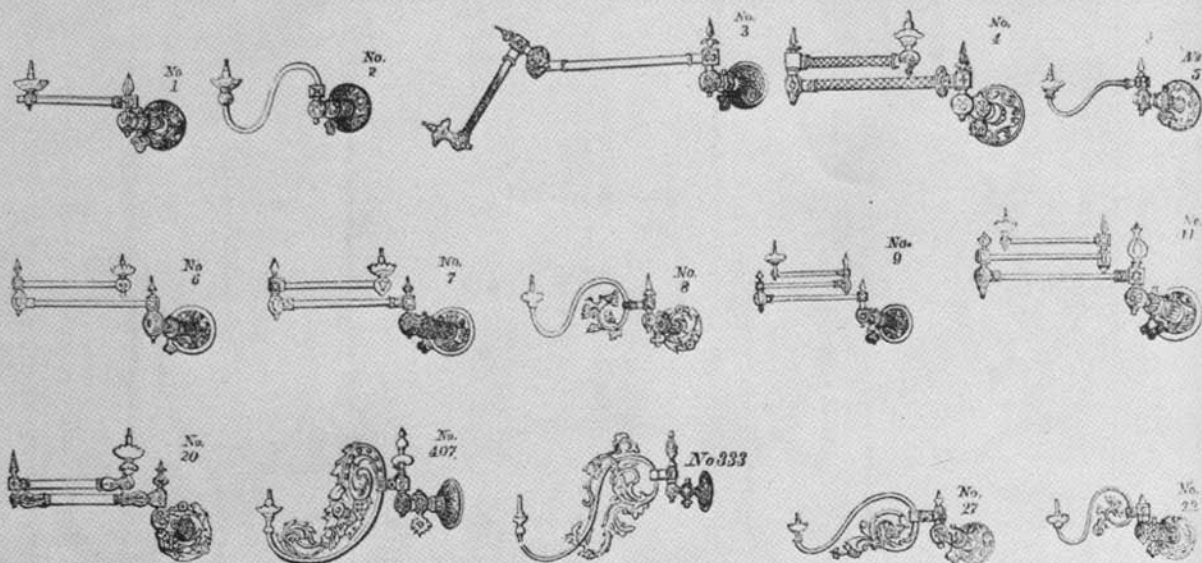


"La," Large ; "S," Small ; "El," Elbow ; "C. S.," Centre Swing.



The "Slides" draw 18 in. to 2 feet. No. 310 is Slide. Nos. 300 and 310 we also have without Slides.

GAS BRACKETS—HALL PENDANTS.



FELLOWS, HOFFMAN & CO.,

N^o 190



N^o 107



N^o 6



Spread 20 in.

N^o 259



Spread 18 inches

N^o 201.

N^o 89



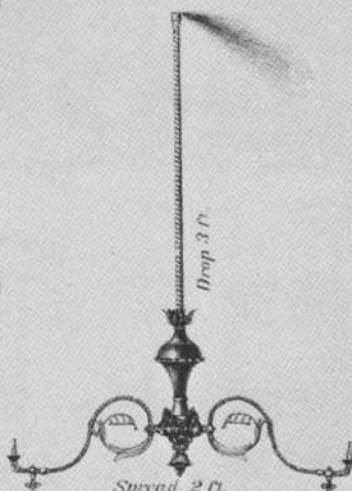
18 in.

N^o 90



10 in.

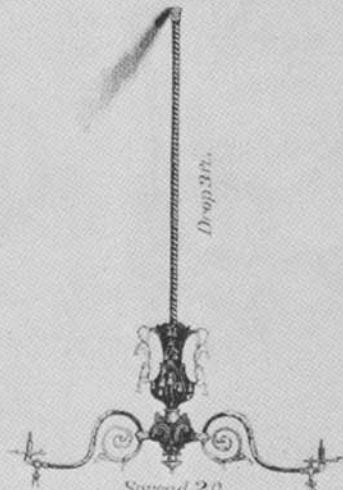
No. 240.



Drop 3 ft.

Spread 2 ft.

N^o 263.



Drop 3 ft.

Spread 2 ft.

N^o 100



Drop 4 feet

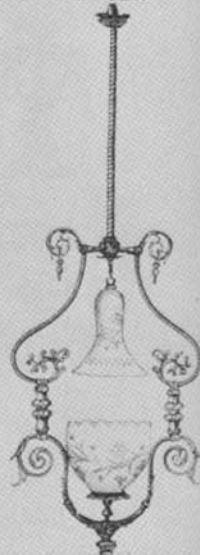


Spread 28 in.

N^o 15



N^o 145.

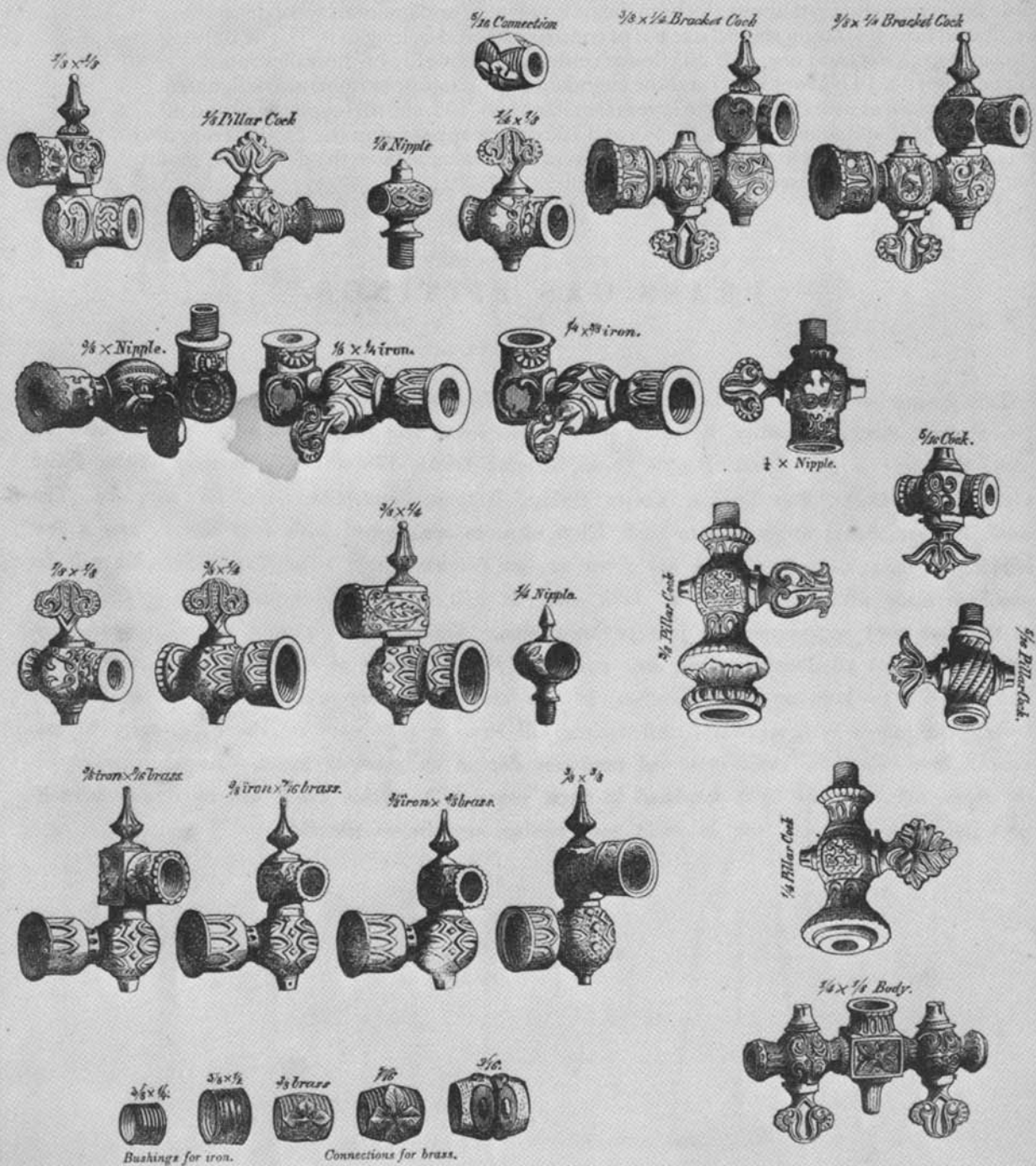


N^o 147



Drop 5 feet 9 inches

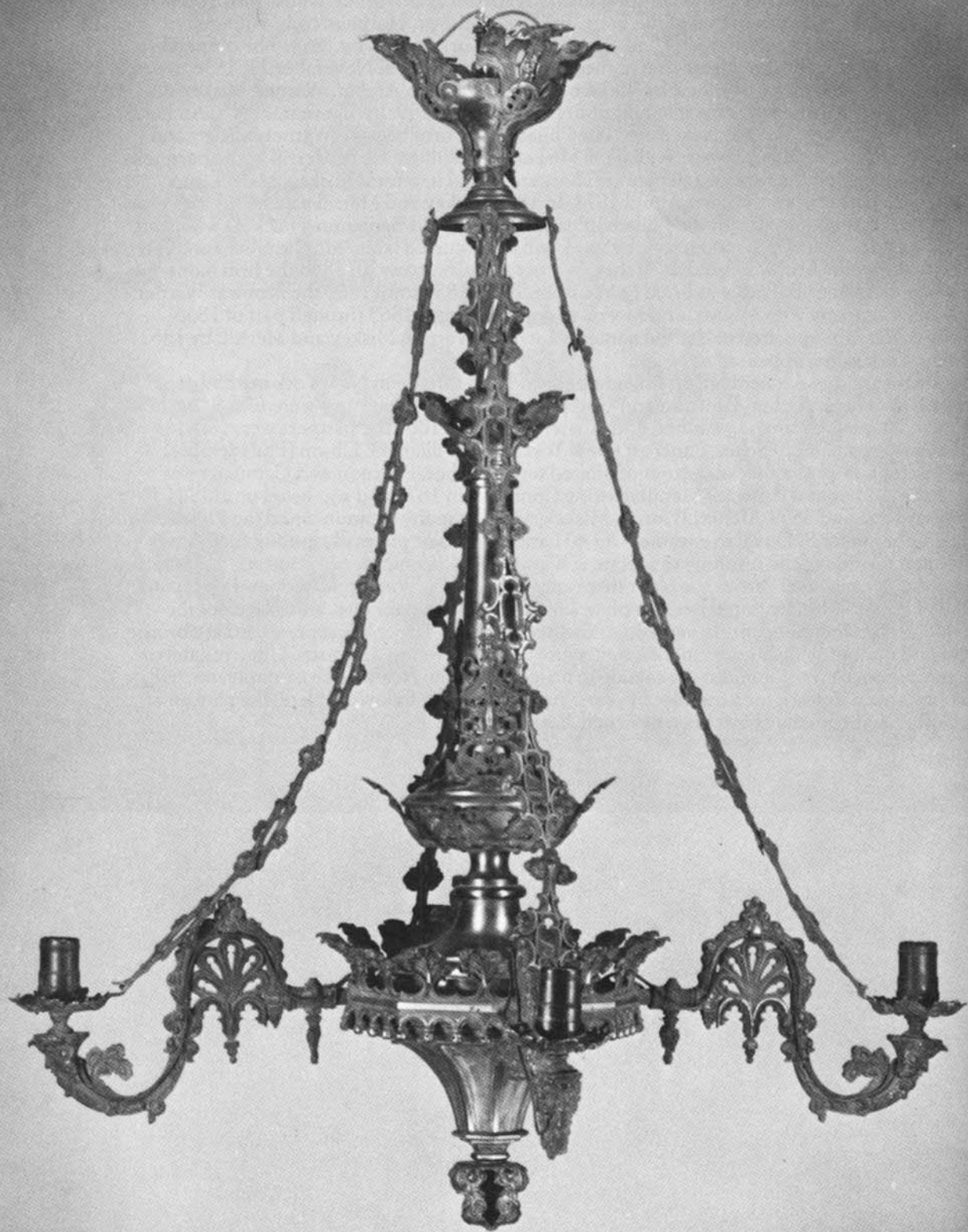
BRASS FITTINGS FOR BRASS AND IRON PIPE.



ARCHER, WARNER,
MISKEY & CO

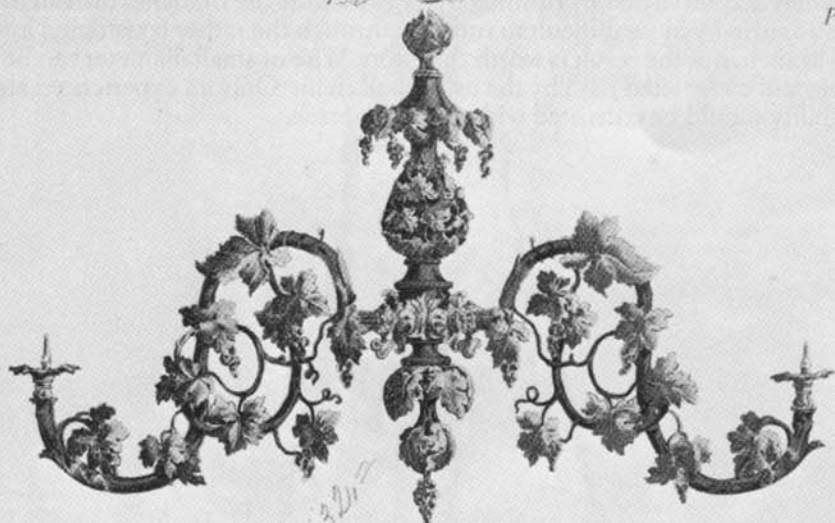


BRACKETS



ARCHER, WARNER,
MISKEY & CO

PL. 4



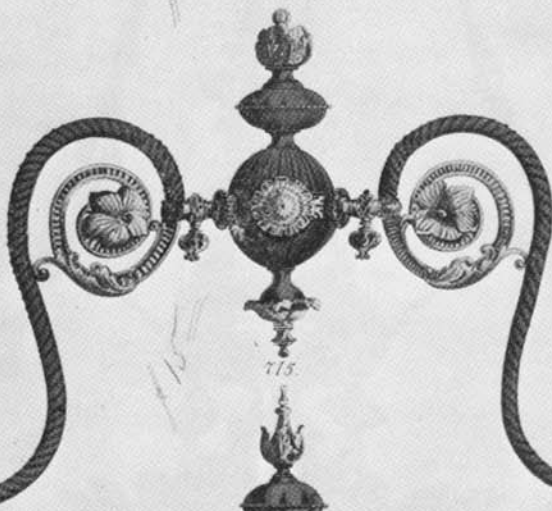
527



527



763-748



715

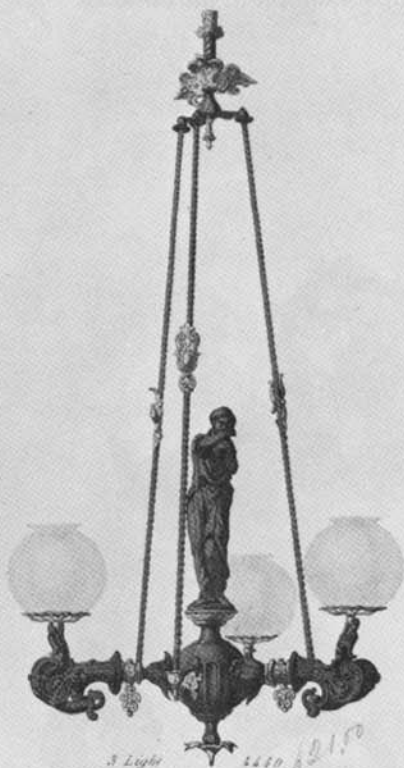


748

BRACKETS

ARCHER, WARNER,
MISKEY & CO

PL 19



3 Light

4450

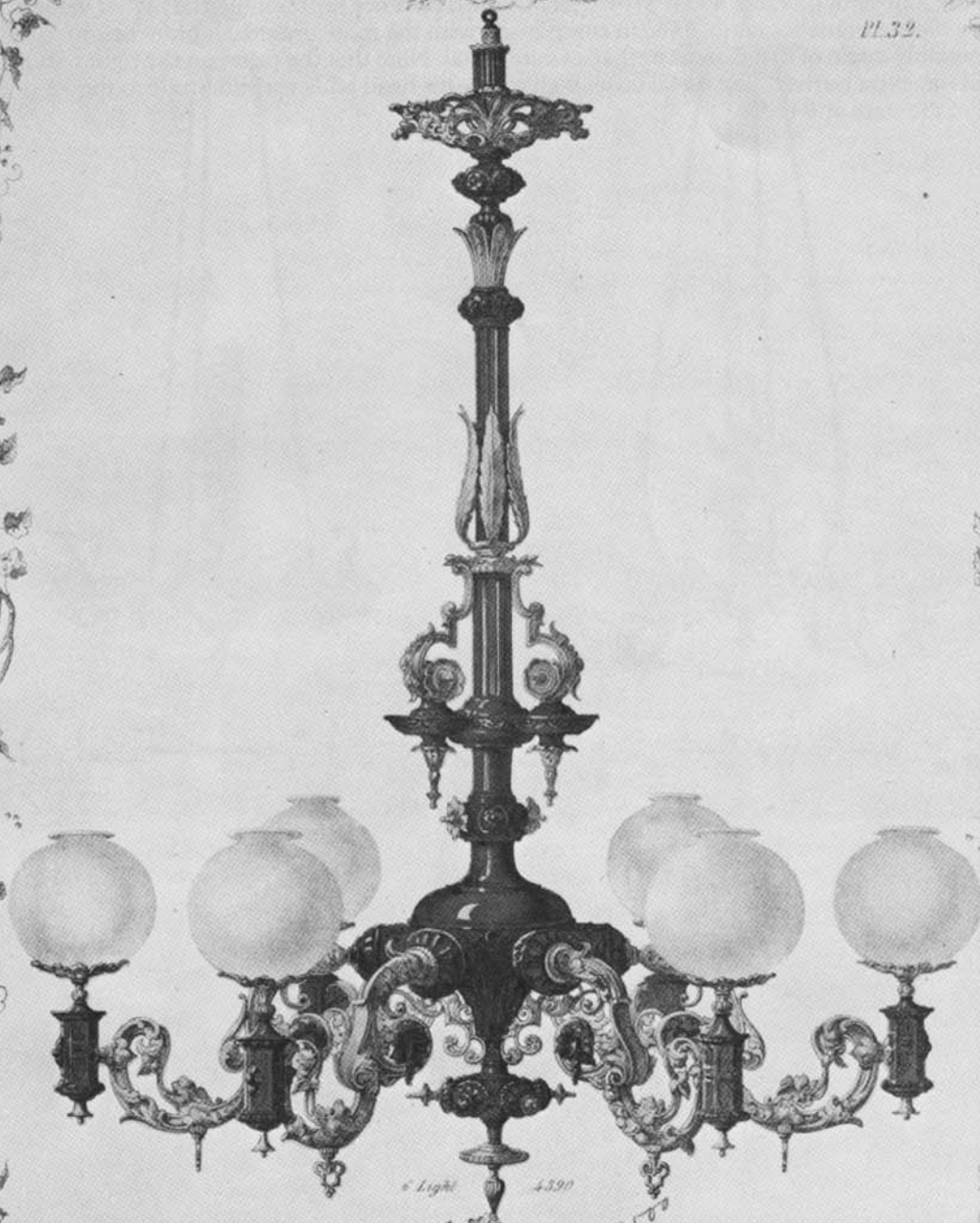


4 Light 4336

CHANDELIERS

ARCHER WARNER
MISKEY & CO

PL 32.



6 Light 4590

75.00

CHANDELIER

Printed in Colors by F.S. Dwyer & Son, Phila.

ARCHER WARNER
MISKEY & CO.

PL. 20



Pillar 0196
Flasche 17



PILLAR LIGHTS





EXTENSION GAS FIXTURE

MONSON'S PATENT.

This well approved and unrivaled Fixture is manufactured and for sale by

STILLMAN MOORE,
CORNER OF STATE & COURT STS.,
NEW HAVEN, CONN.

It is not too much to say that this is an article which may be recommended as quite the best, the most safe and durable Extension Gas Fixture in the world.

It is not a sliding tube. The extension is accomplished by the turning of tubes one within another, which are so protected against wear that even if the weight of the pendant were not counterbalanced, it could not come upon the tubing at all; and the ornamental levers which take the strain insure a uniform and beautiful movement.

The purchaser need have no fears of its leaking. It can also be attached to Chandeliers or pendants now in use. Testimonials like the following are voluntarily offered to any extent:

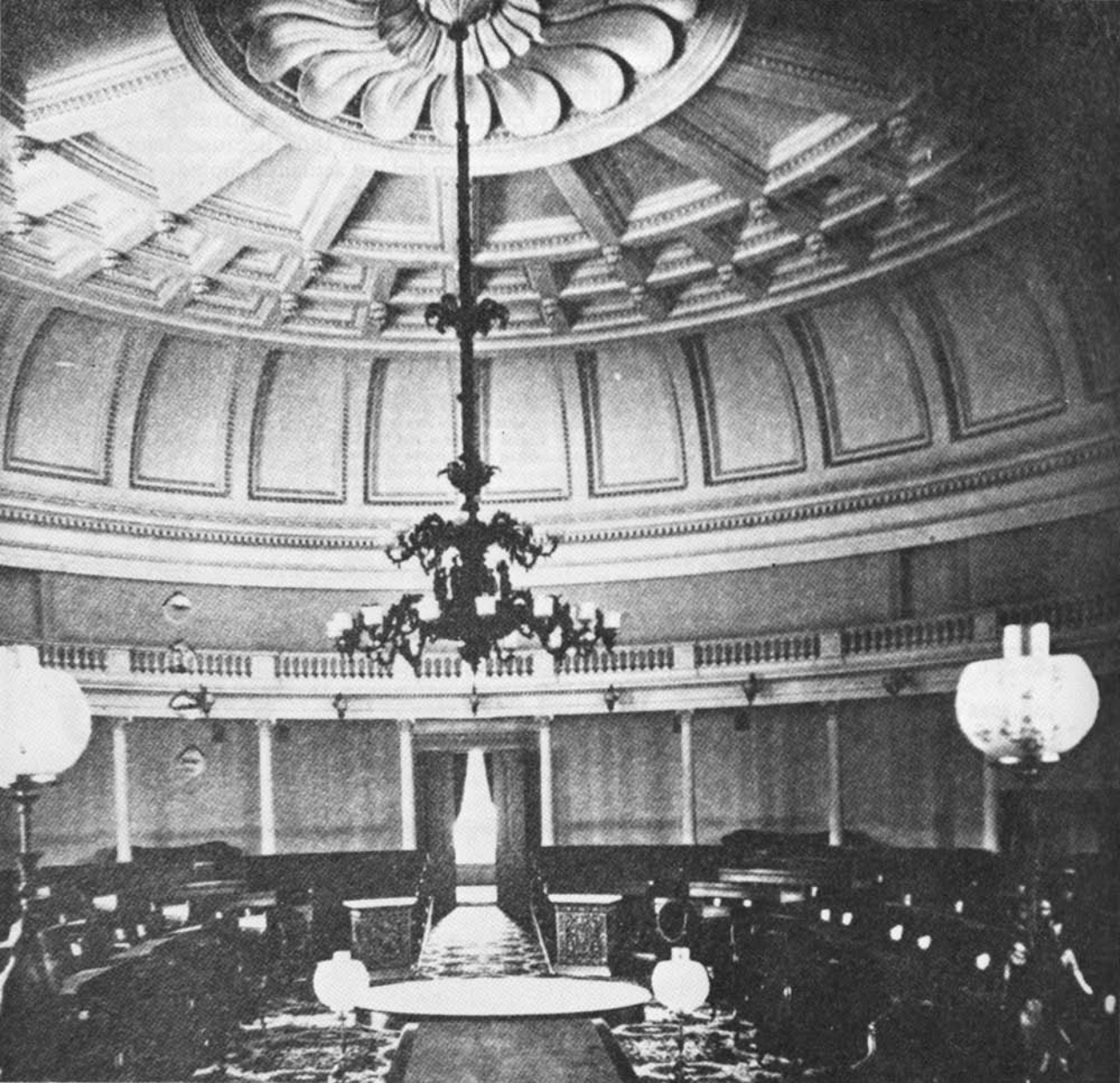
"After many months' trial of the above Extension Tube, we do fully concur in recommending the same as a well constructed and durable fixture, a most useful and excellent contrivance. We should be unwilling to exchange it for any other kind of Gas Fixture which we have ever seen."

IT IS ALSO FOR SALE BY

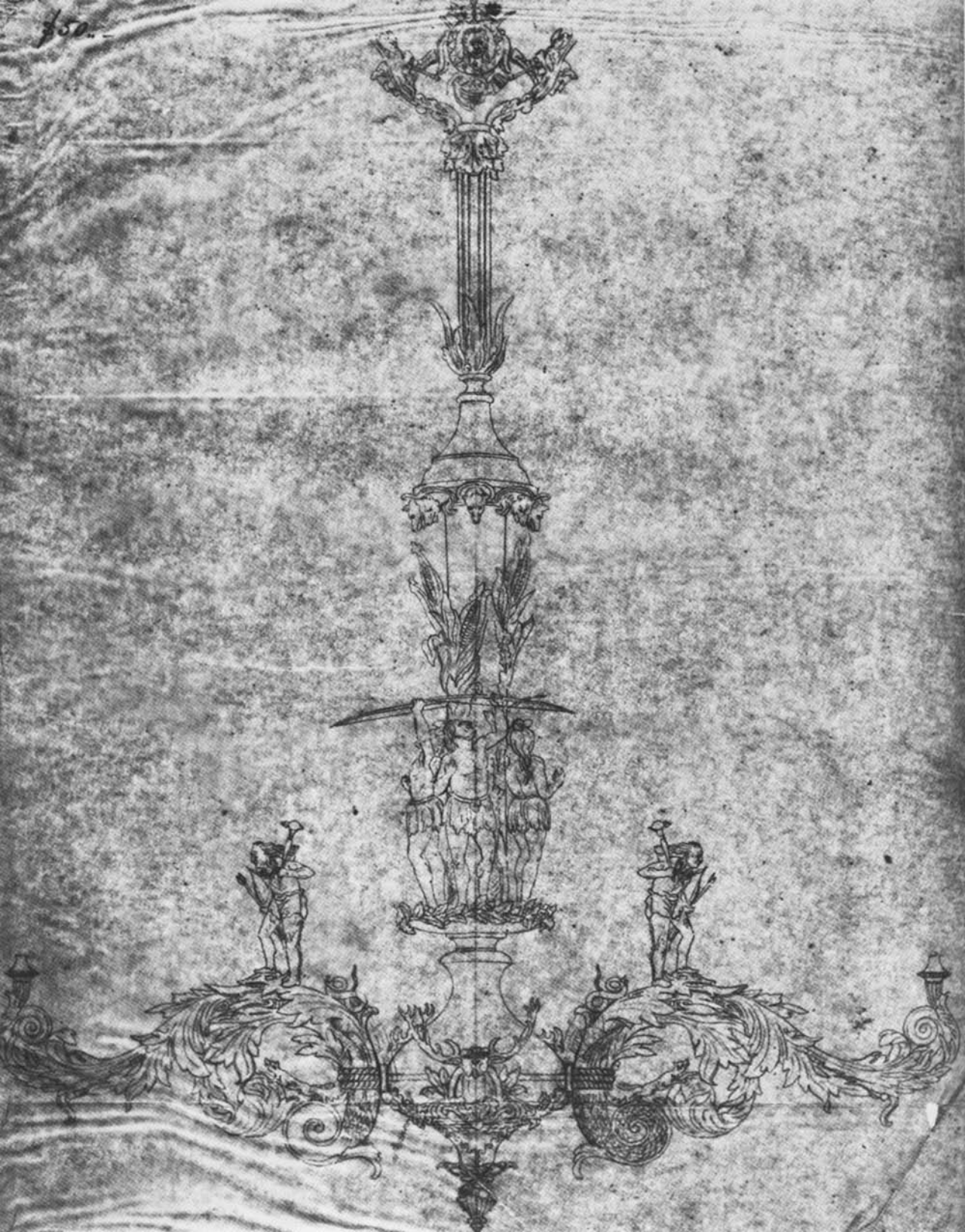
GEO. H. KITCHEN & CO.,
DEALERS IN GAS FIXTURES
AND IMPORTERS OF

Paris Fancy Goods, Parian, Bisque & Bronze Statuary, China Vases, &c.
No. 561 BROADWAY, NEW YORK.

N. B.—This Gas Fixture is recommended and adopted in the Government Buildings under sanction of Major A. H. BOWMAN, Engineer in charge, Construction Office, Washington.

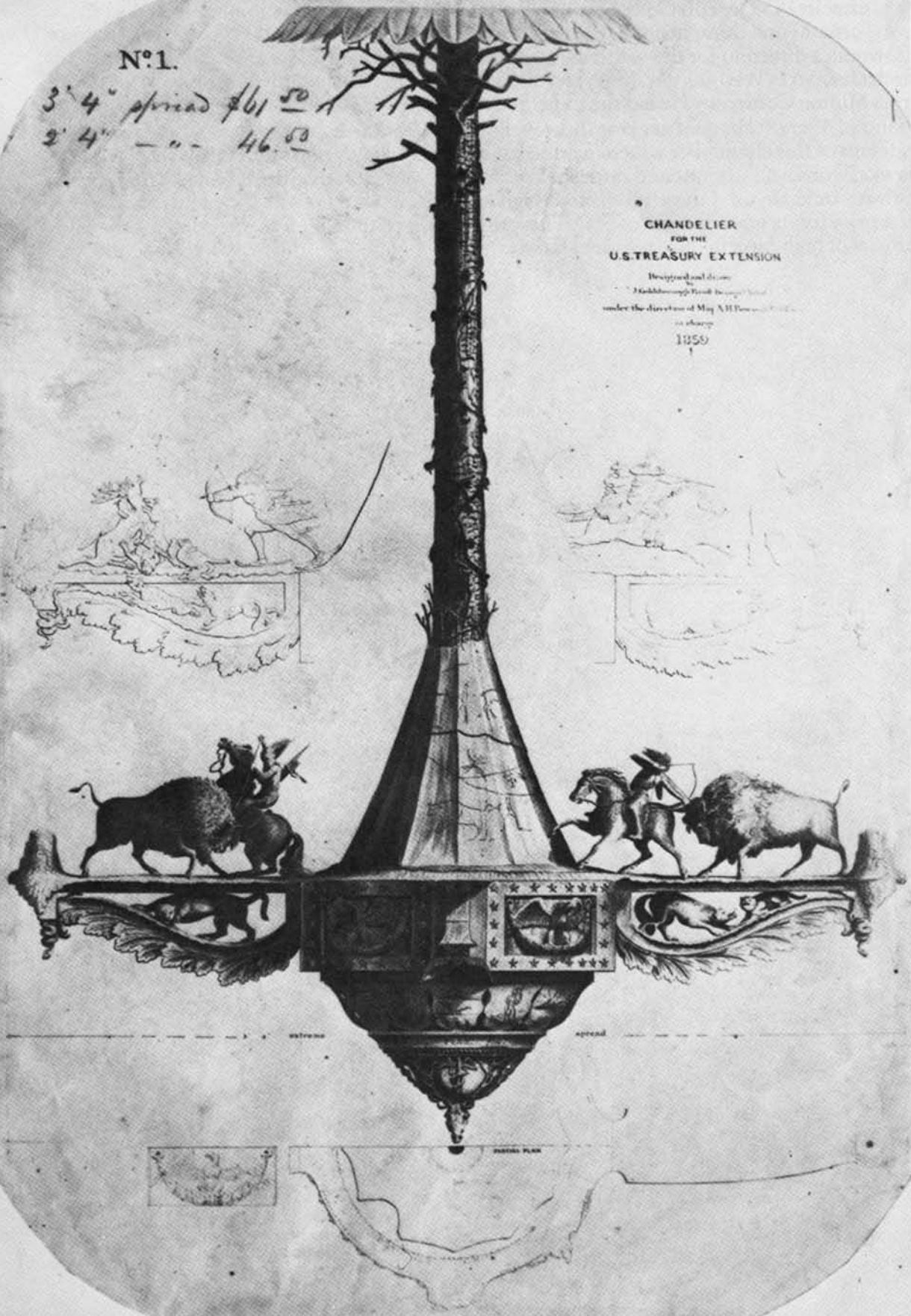






3' 4" spruce \$61.50
2' 4" - " - 46.50

Descripted and drawn
by
J. Kaddah
under the direction of May A.H. Fawcett
in charge
1959



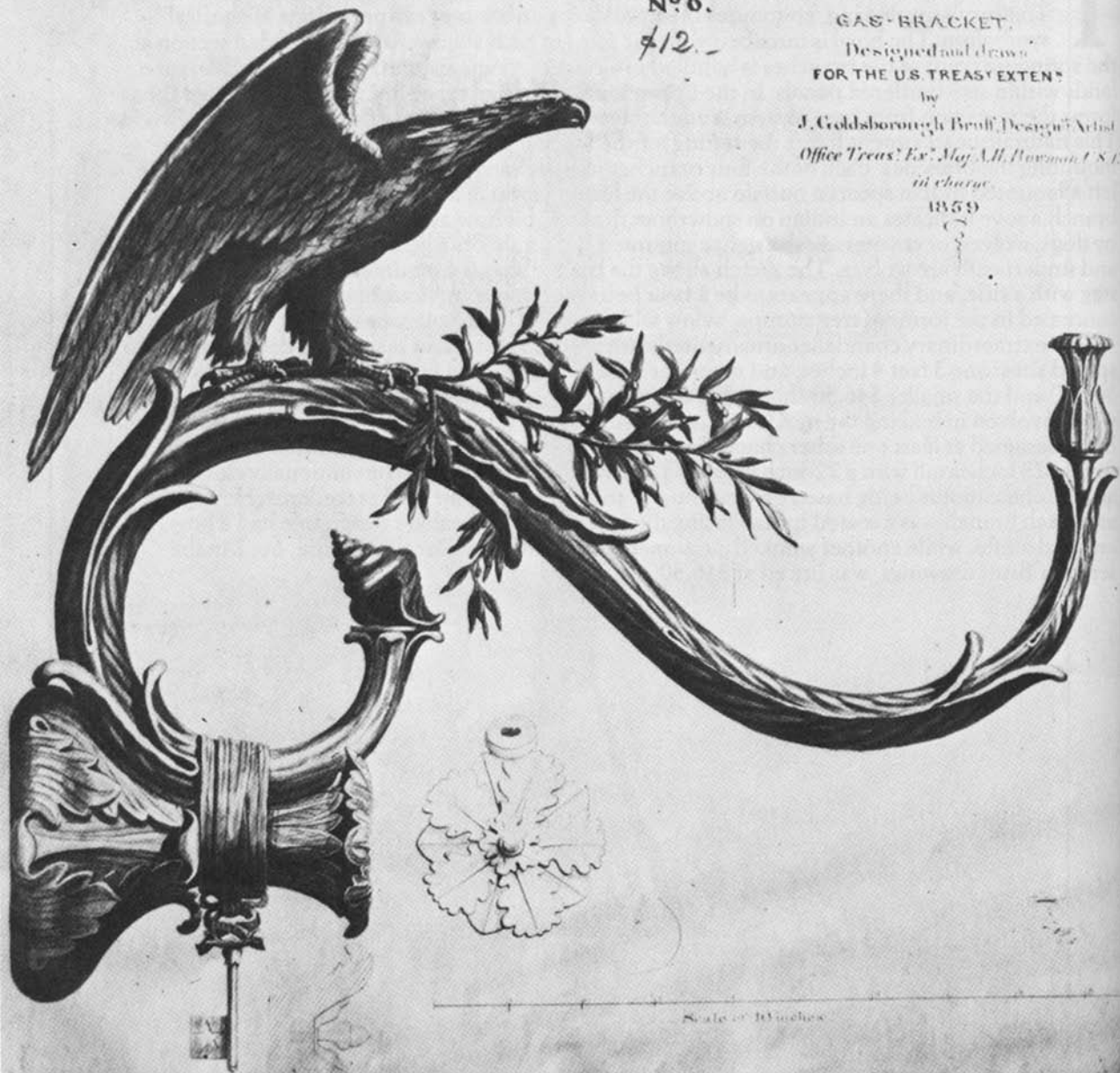
Nº 6.

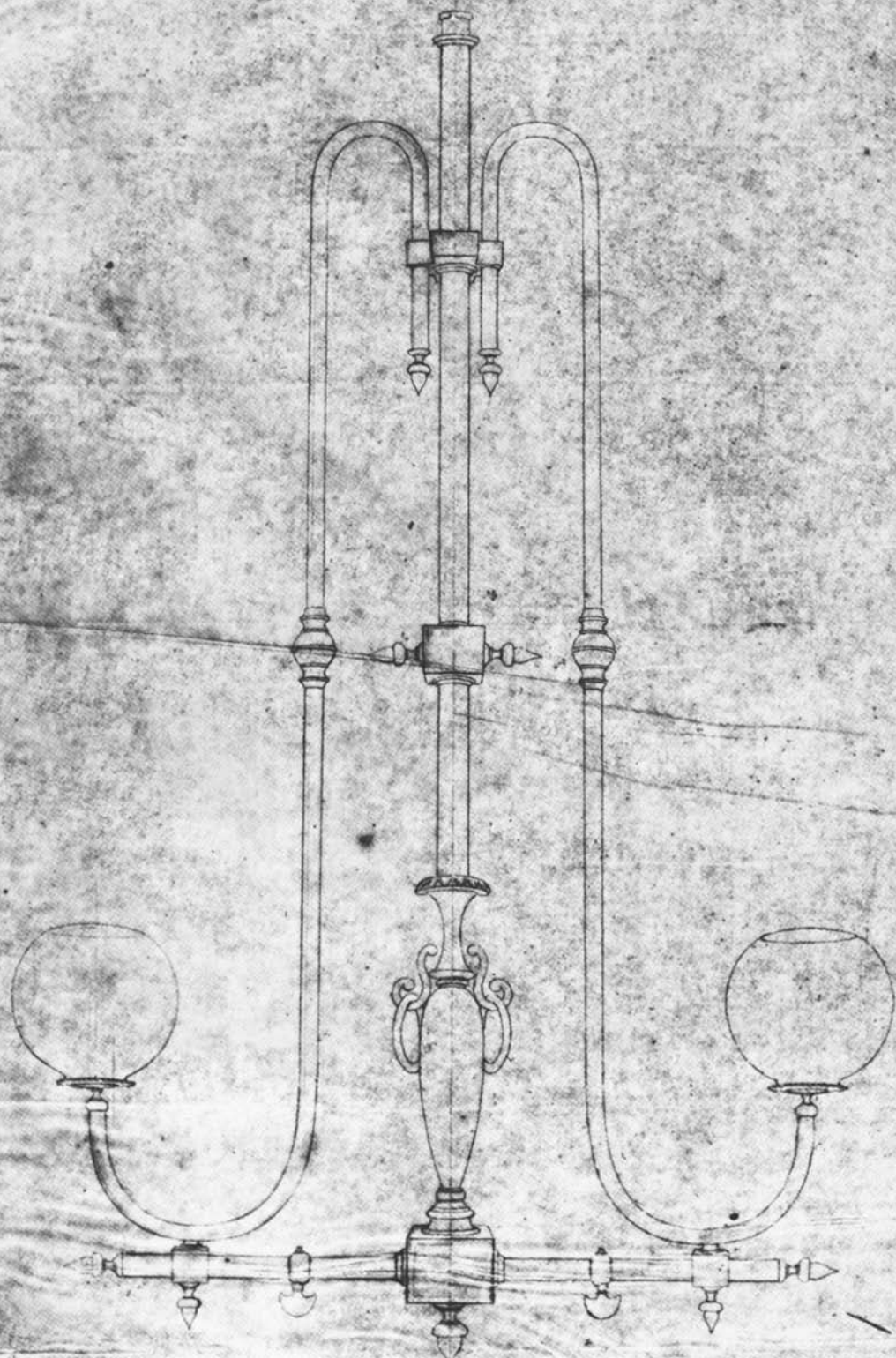
712.-

GAS-BRACKET.
Designed and drawn
FOR THE U.S. TREASURY EXTENSION

by
J. Goldsborough Bruff, Designer & Artist
Office Treas. Ex. Maj. A. H. Rowman, U.S.A.
in charge.

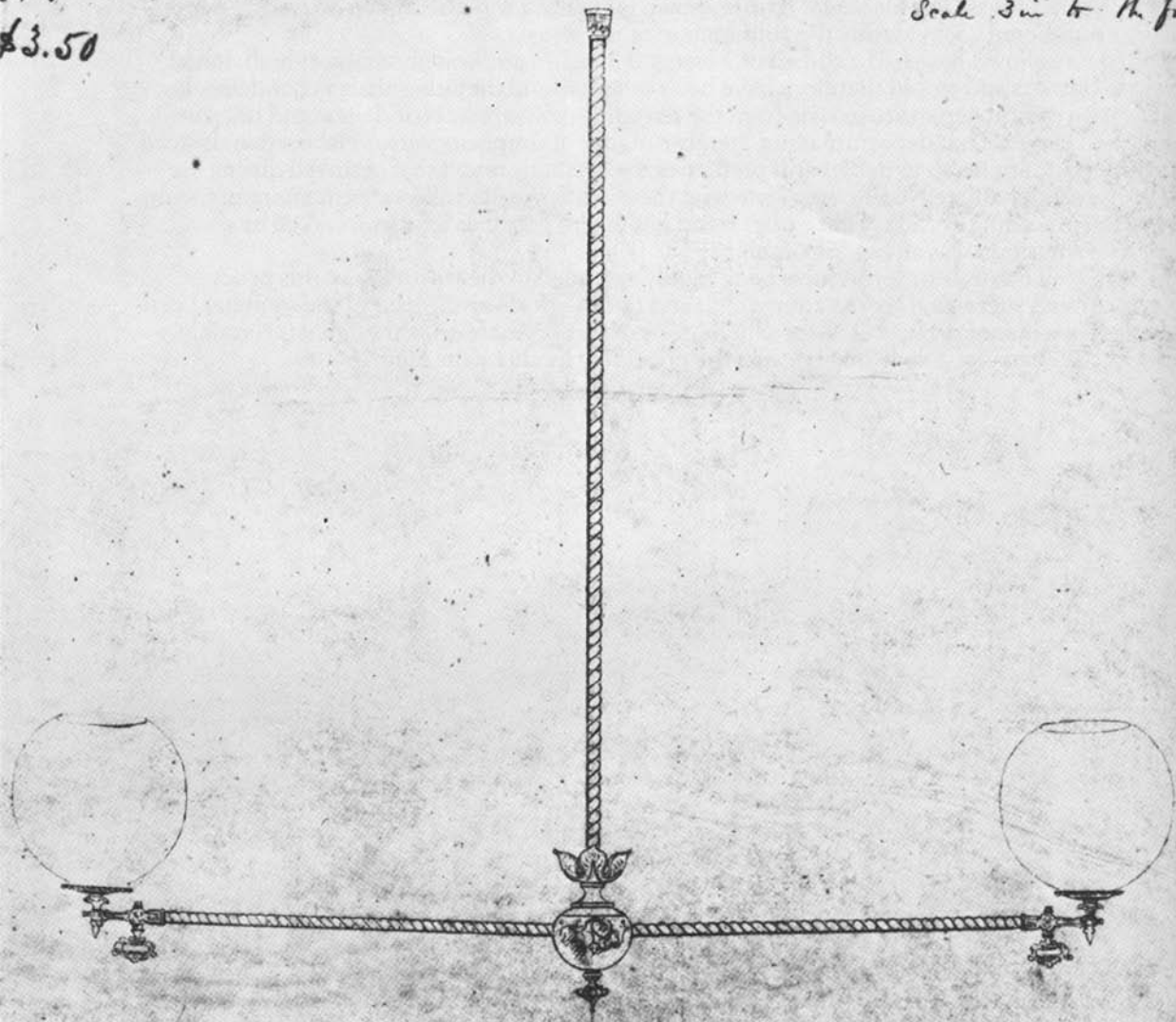
1859





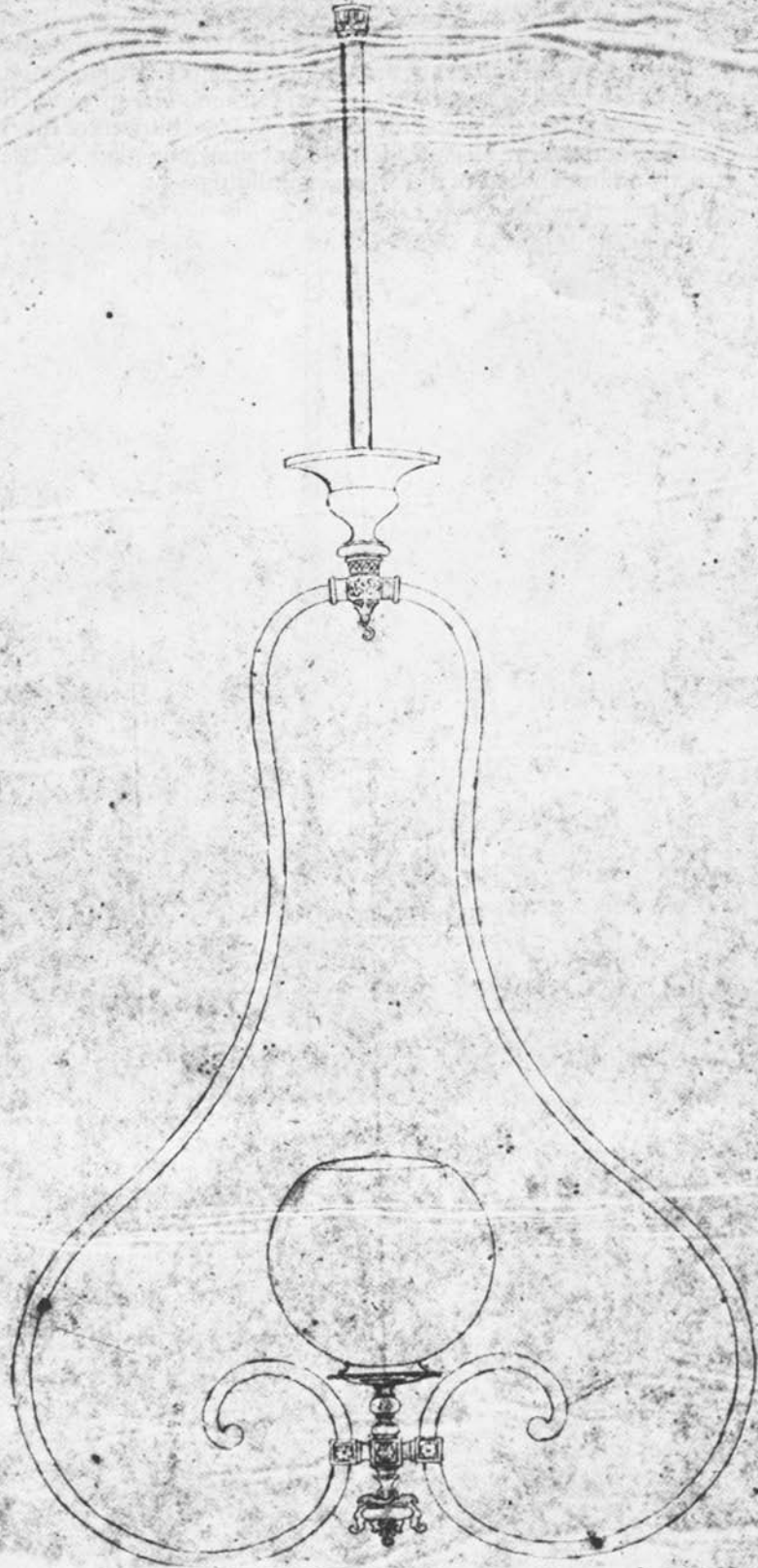
018
\$3.50

Scale 3 in to 1 ft

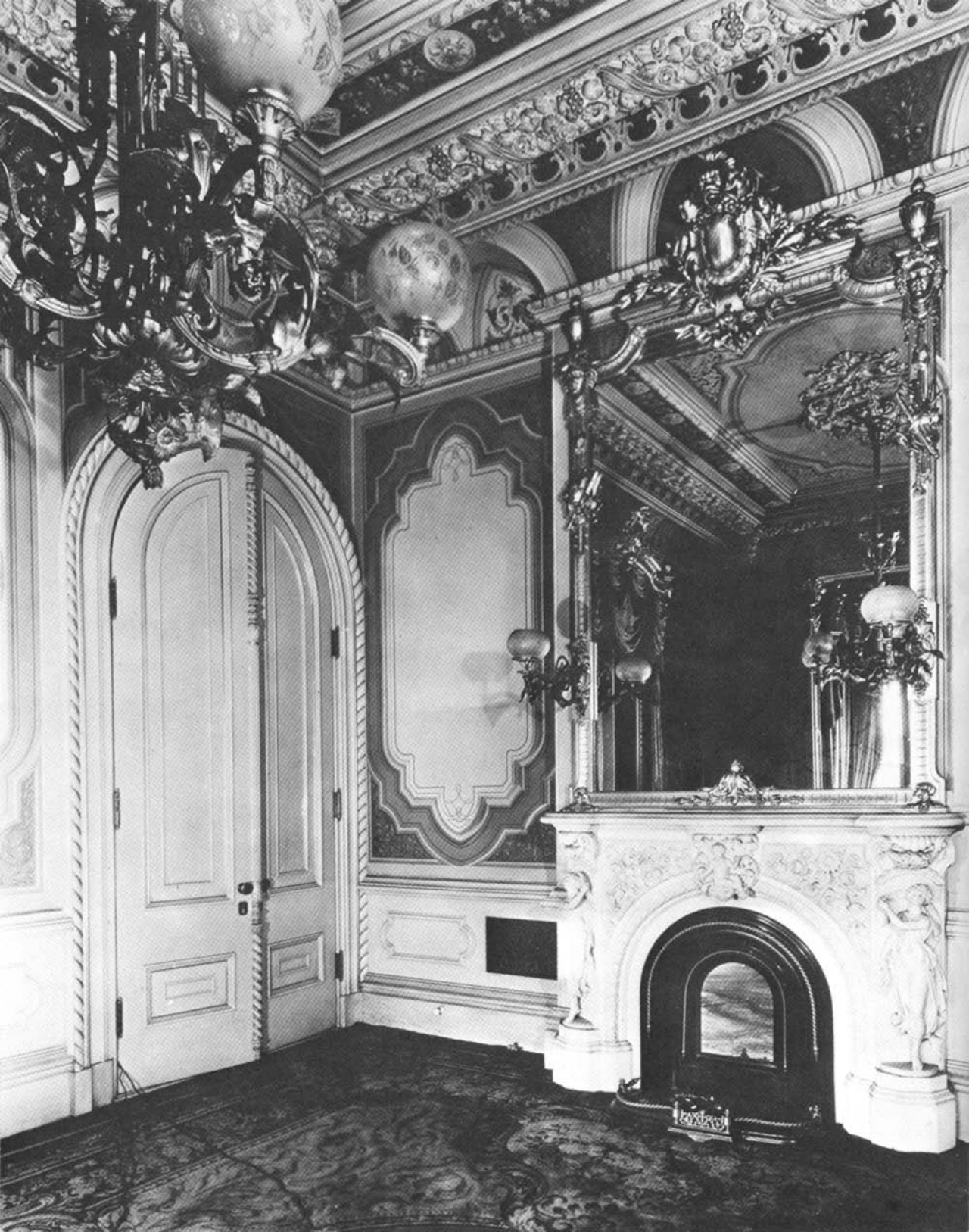


No 13
\$5.-

Seal
Buck











THE PARIS UNIVERSAL EXHIBITION.

We engrave on this page four CHANDELIERS of Cast

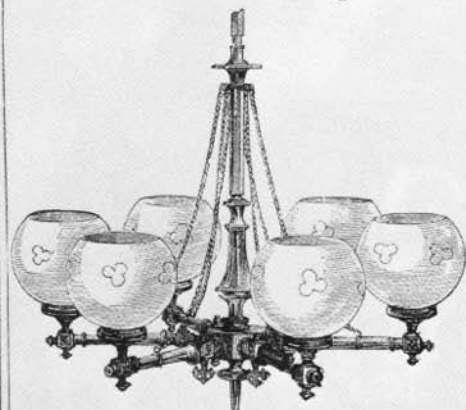
these productions are of considerable merit; as mere castings they are unsurpassed. The designs also are of more than ordinary value. Their peculiar worth, how-



Iron, manufactured and exhibited by Mr. TUCKER, of



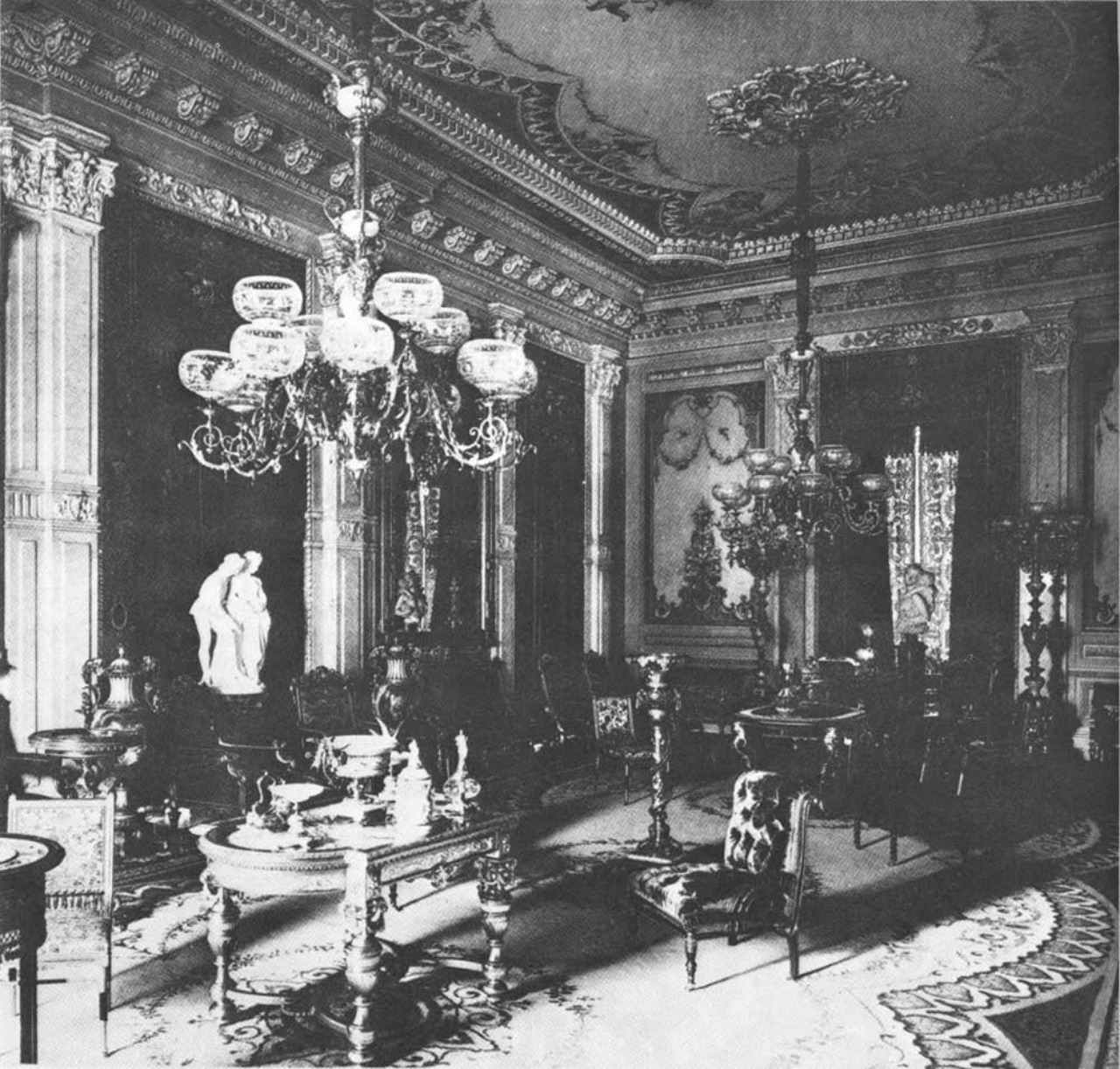
New York and Boston. America gives but scant



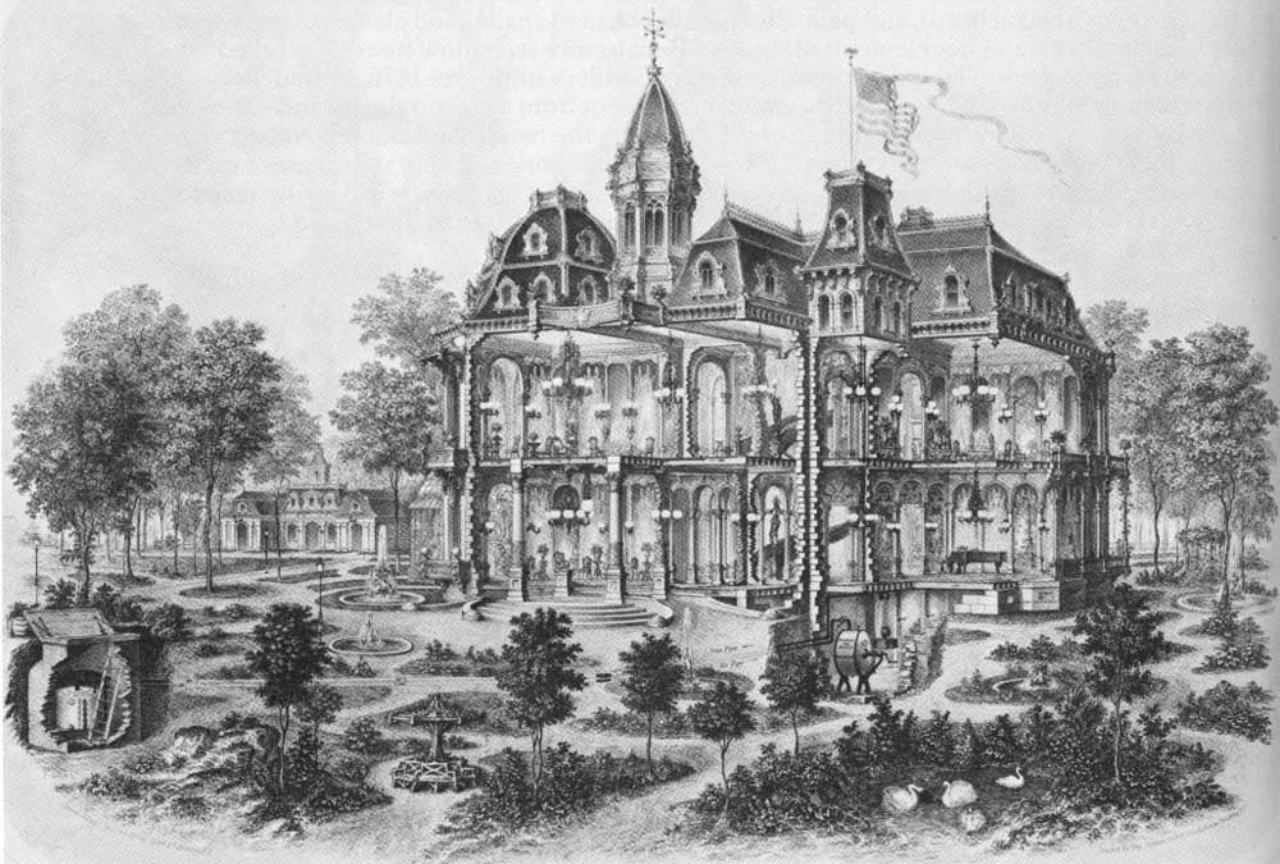
material for introduction into our Catalogue, but

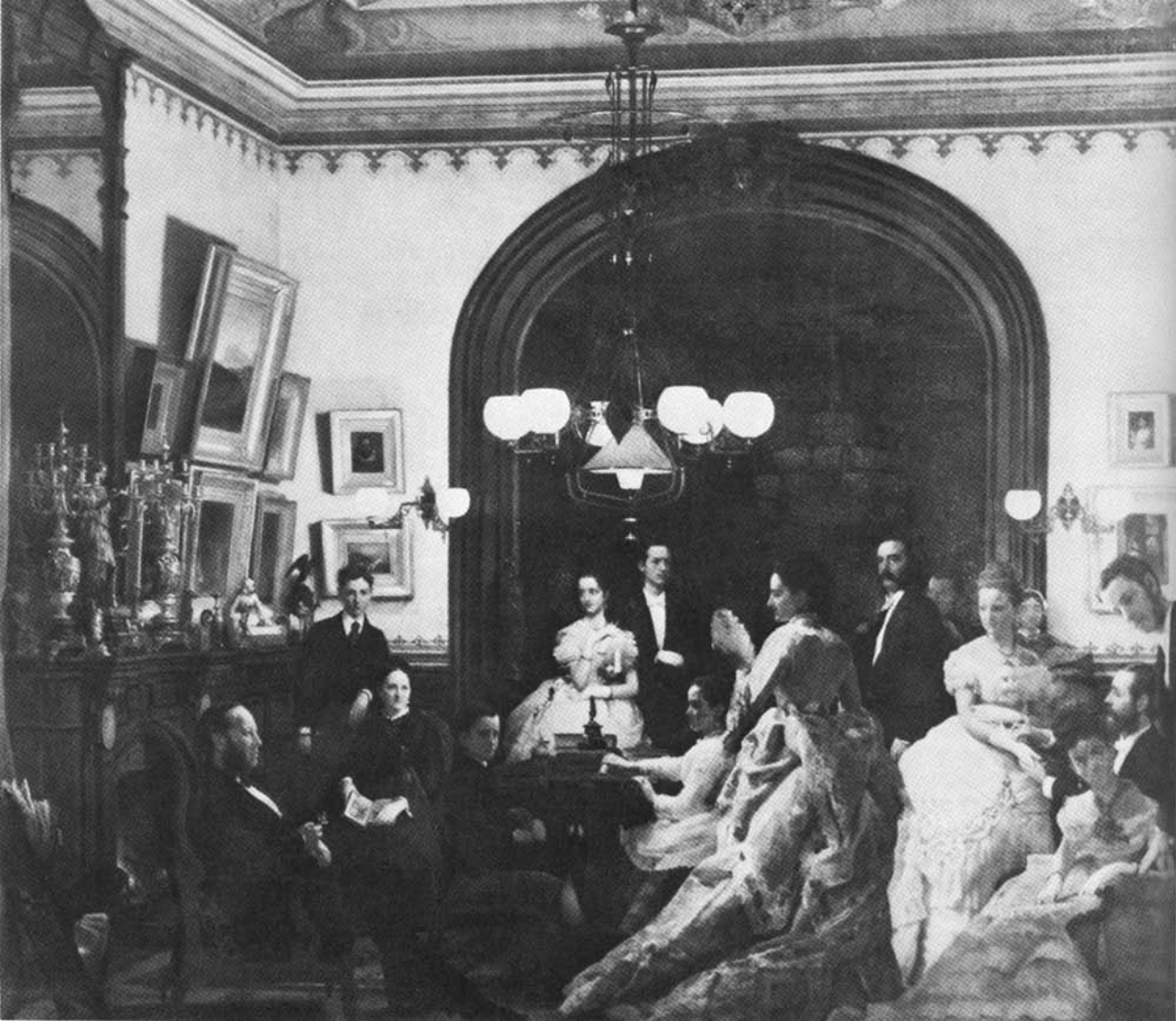
ever, is derived from a new and very interesting process of manufacture, to describe which here is impossible, but to which we shall elsewhere direct public attention.

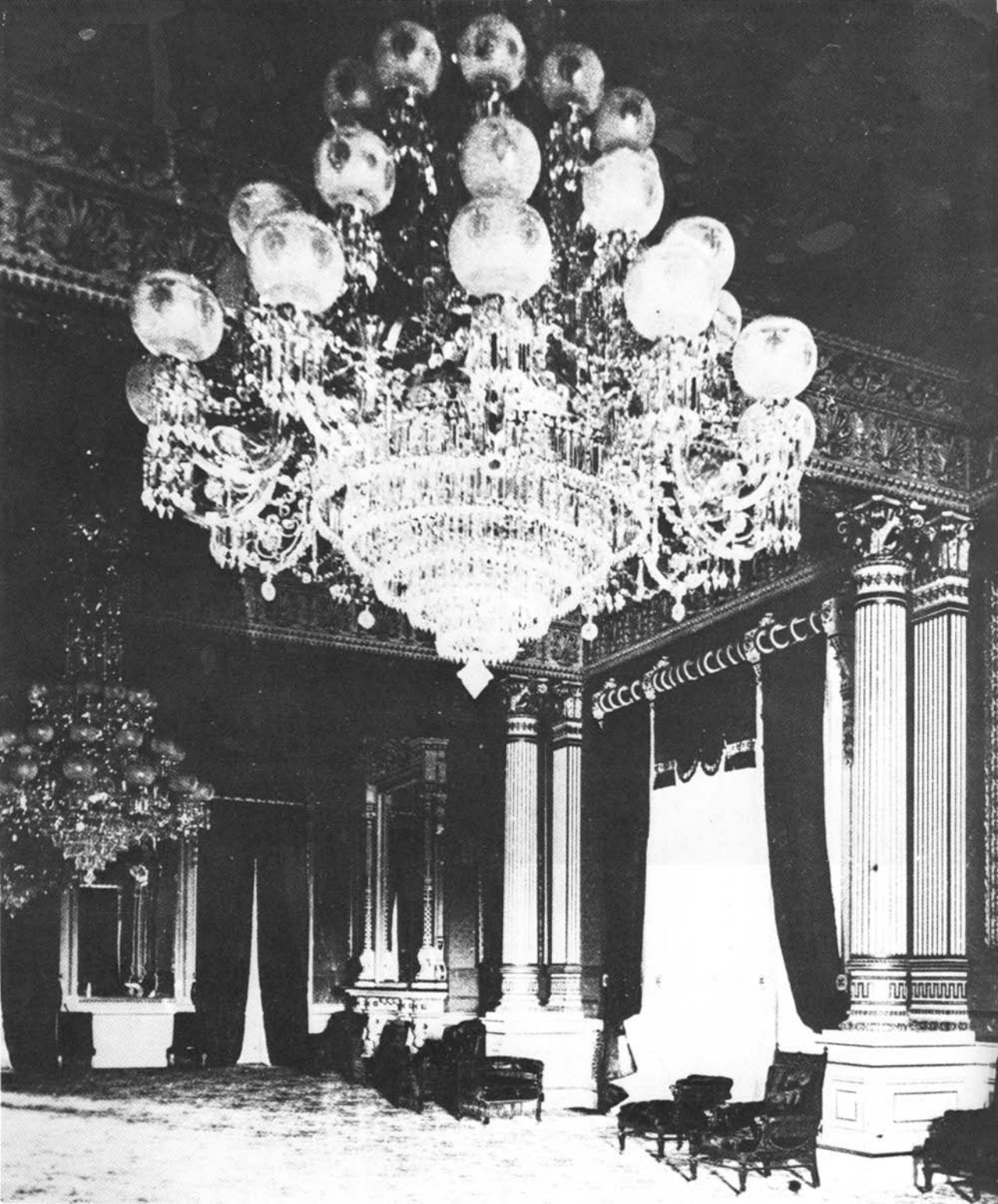
















WASHINGTON GLASS WORKS EXHIBIT, 1906

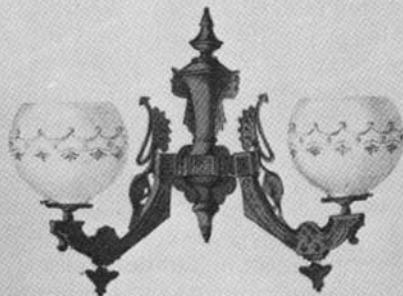
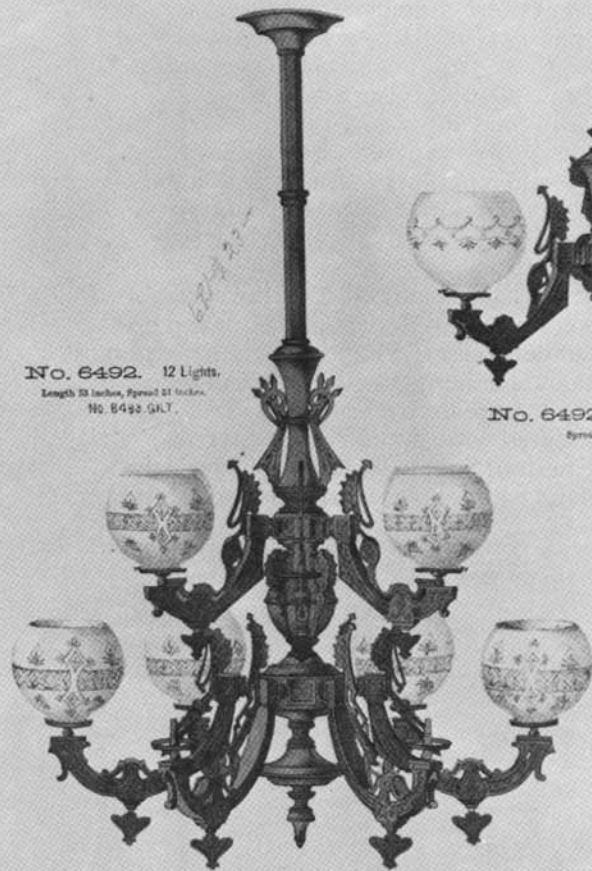




2295

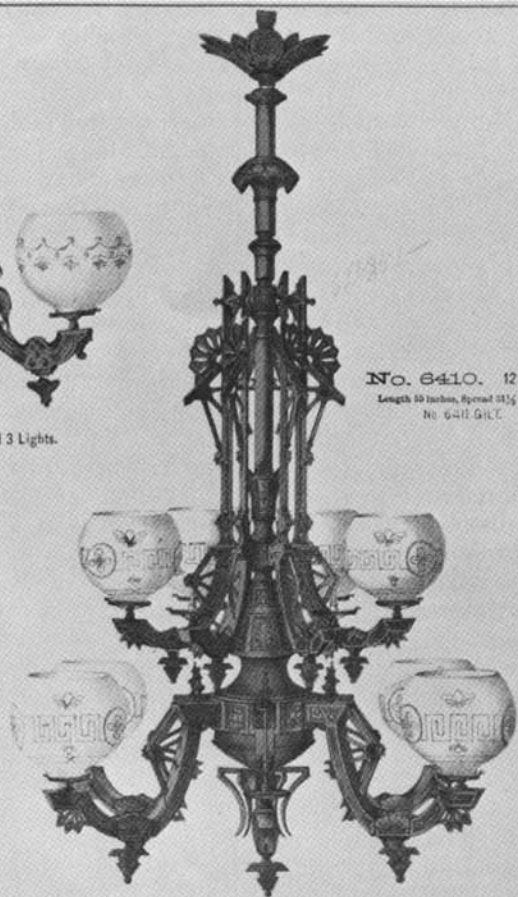
2295—GAS FIXTURE

No. 6492. 12 Lights.
Length 33 inches, Spread 21 inches.
No. 6492 GALT.

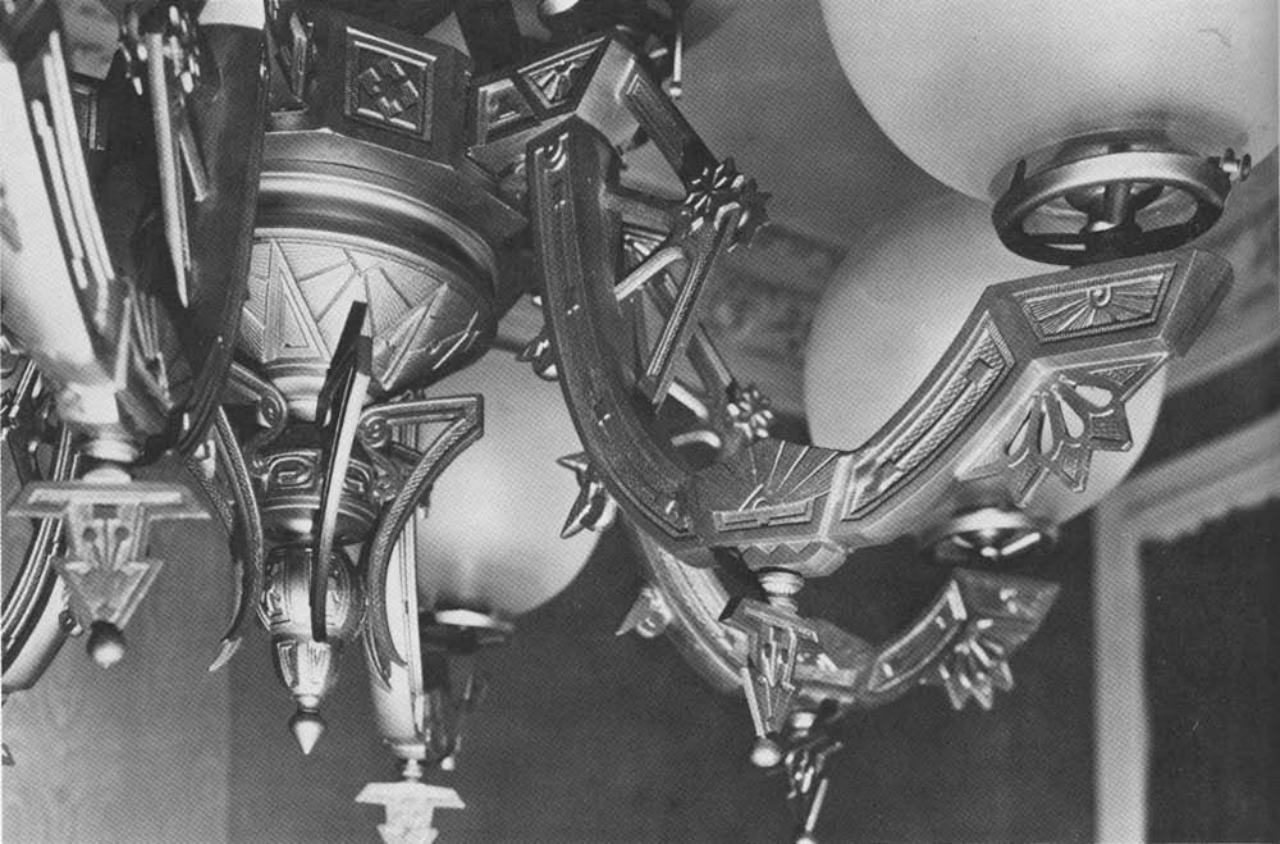


No. 6492. 1, 2 and 3 Lights.
Spread 17 inches

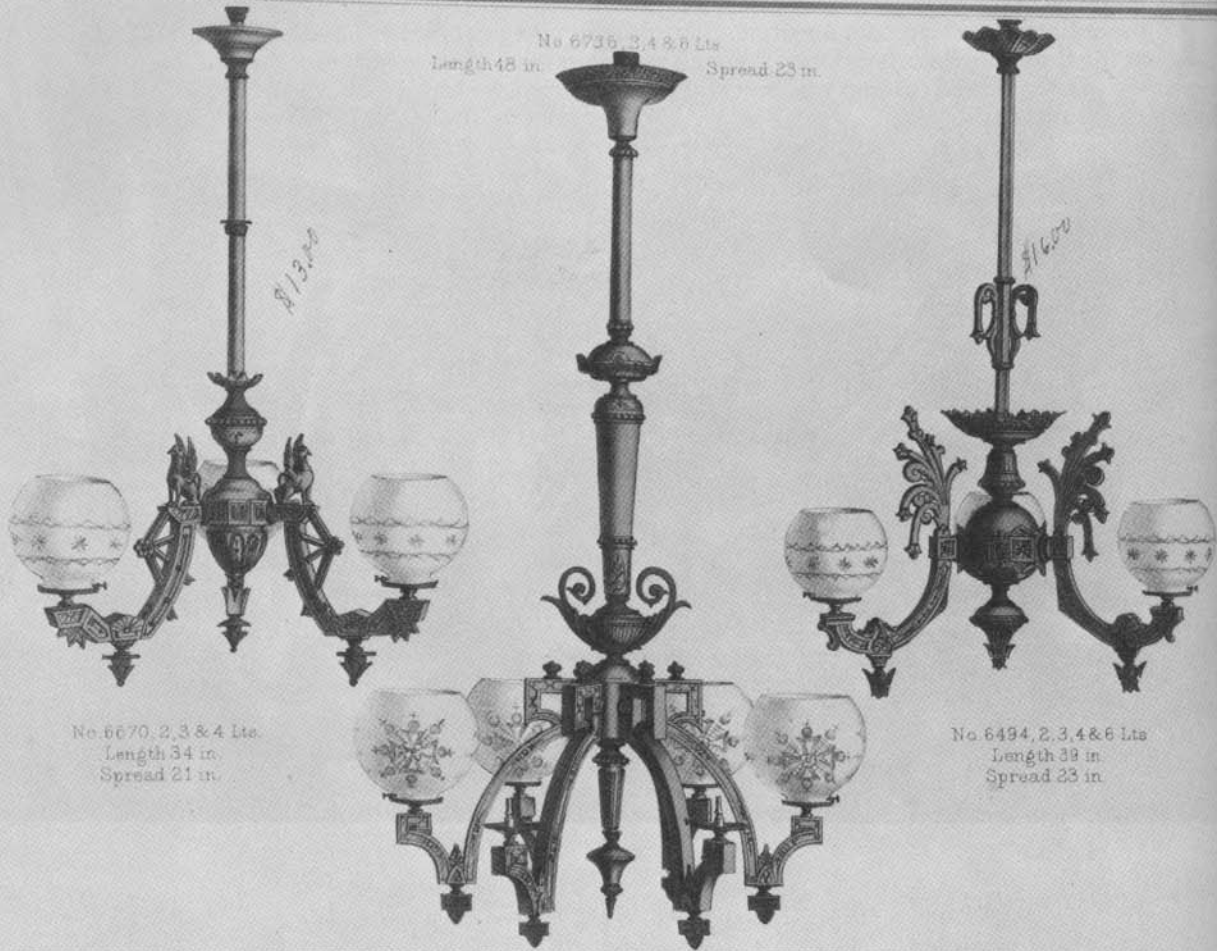
No. 6410. 12 Lights.
Length 30 inches, Spread 18 1/2 inches.
No. 6410 GALT.







No 6735 2, 4 & 6 Lts
Length 48 in. Spread 23 in.



No. 6670, 2, 3 & 4 Lts.
Length 34 in.
Spread 21 in.

No. 6494, 2, 3, 4 & 6 Lts
Length 38 in.
Spread 23 in.





Nº 6772, 9 Lts.
7 ft 6 in high, Spread 19 in.



Nº 6770, 6 & 9 Lts.
Length 22 in.
Spread 19 in.



Nº 6528, 6 & 9 Lts.
Length 26 in.
Spread 19 in.



Nº 6690, 6 & 9 Lts.
Spread 25 in.



N^o 0108 - 3 Lts.
Projects 10 in.



N^o 0110 - 3 Lts.
Projects 12 in.



N^o 0109 1/2 - 2 & 3 Lts.
Spread 14 in.



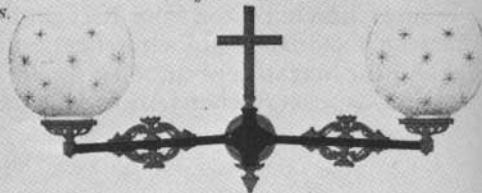
N^o 0108 1/2 - 6 Lts.
Spread 15 in.



N^o 0101 1/2 - 2 & 3 Lts.
Spread 24 in.



N^o 0101 - 1 Lt.
Projects 17 in.

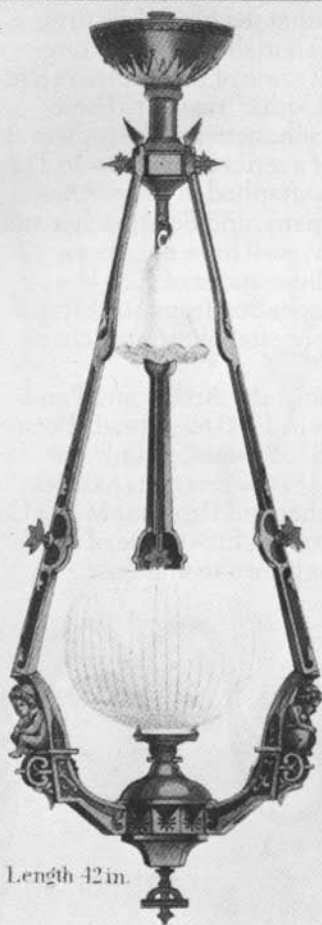


N^o 0103 1/2 - 2 & 3 Lts. Spread 19 in.

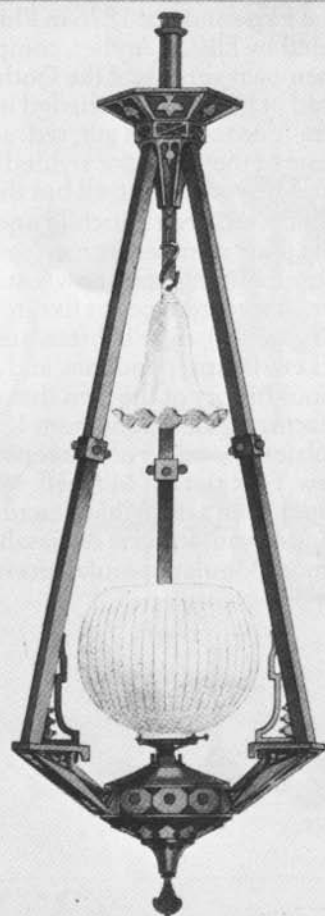
Brett Fairchild & Co. Lith. 116 Fulton St. N.Y.

Archer & Pancoast M'fg. Co.

MANUFACTORY AND WAREHOUSES Nos. 70, 72 & 74 WOOSTER ST. N.Y.



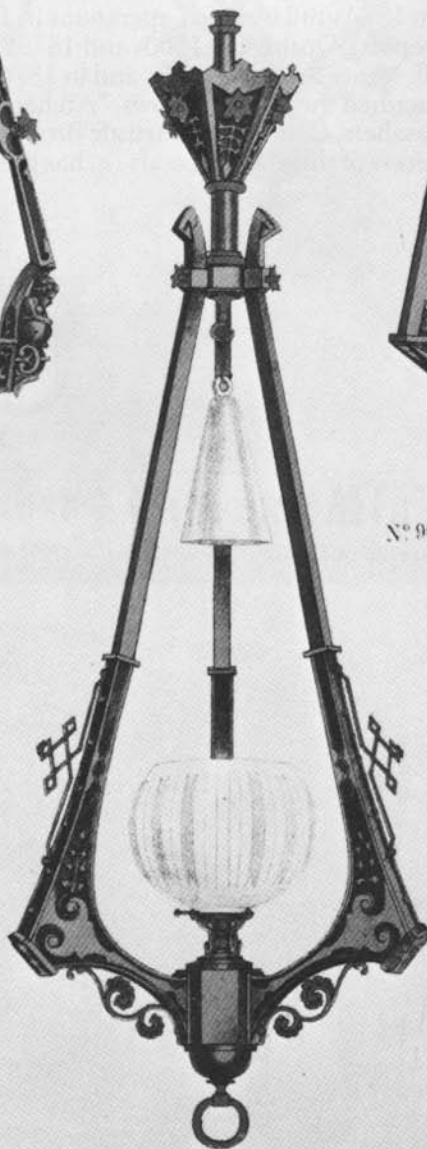
N° 905 Length 42 in.



N° 902 Length 42 in



N° 145 Bracket

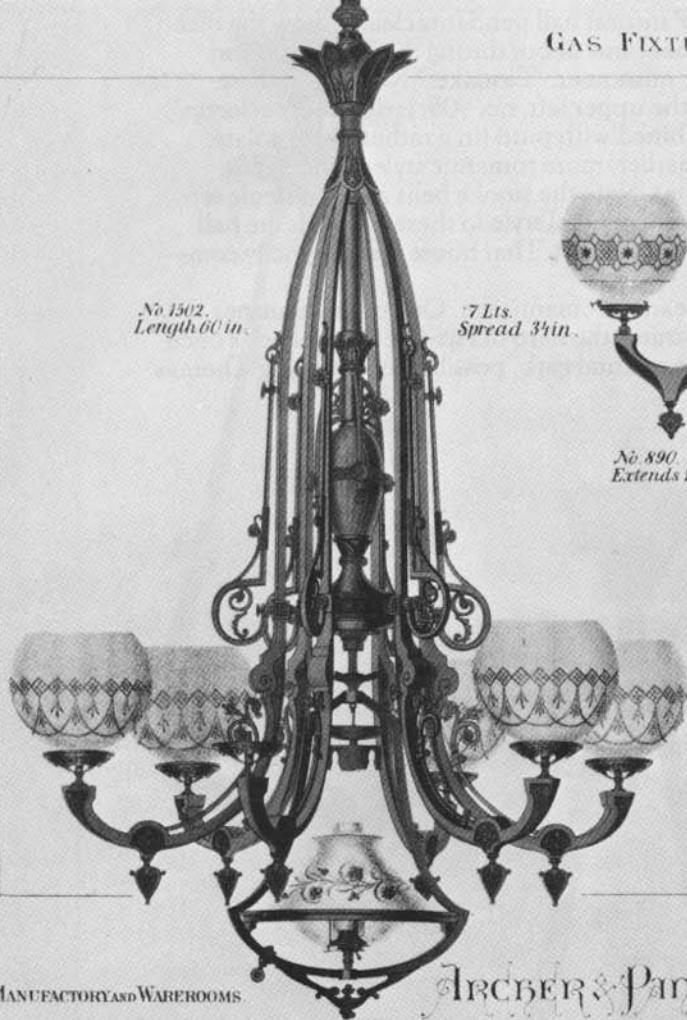


N° 904 Length 52 in.



N° 141 Bracket

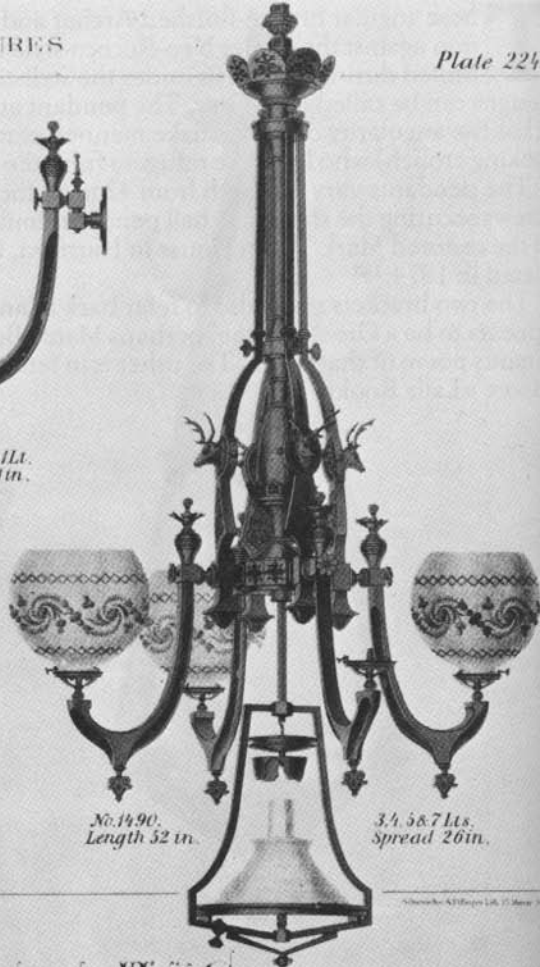
No 1502.
Length 60 in.



7 Lts.
Spread 34 in.



No 890. 1 Lt.
Extends 11 in.



No 1490.
Length 52 in.

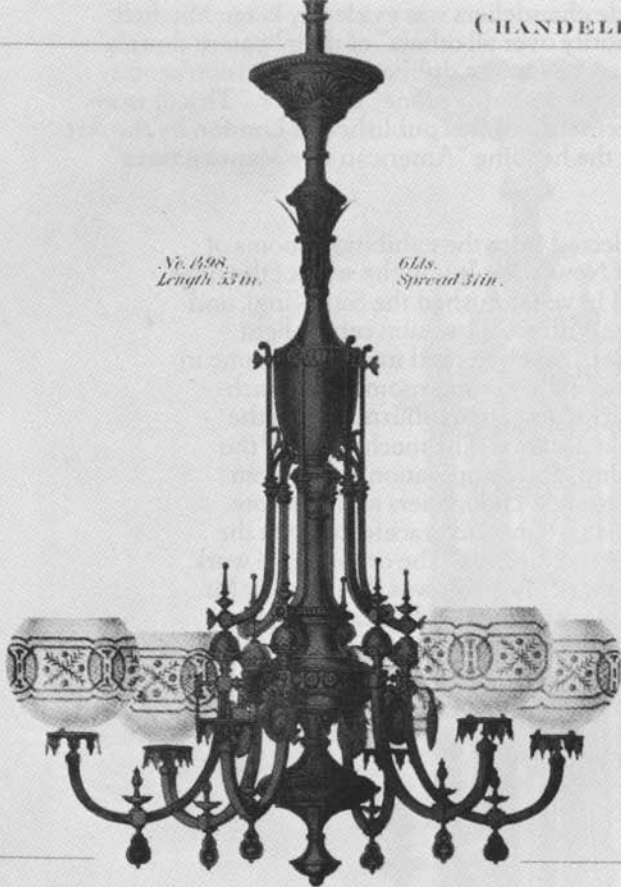
3, 4, 5 & 7 Lts.
Spread 26 in.

Shaded by G. F. Rogers Ltd. 75 Abchurch Lane, London, E.C. 4.



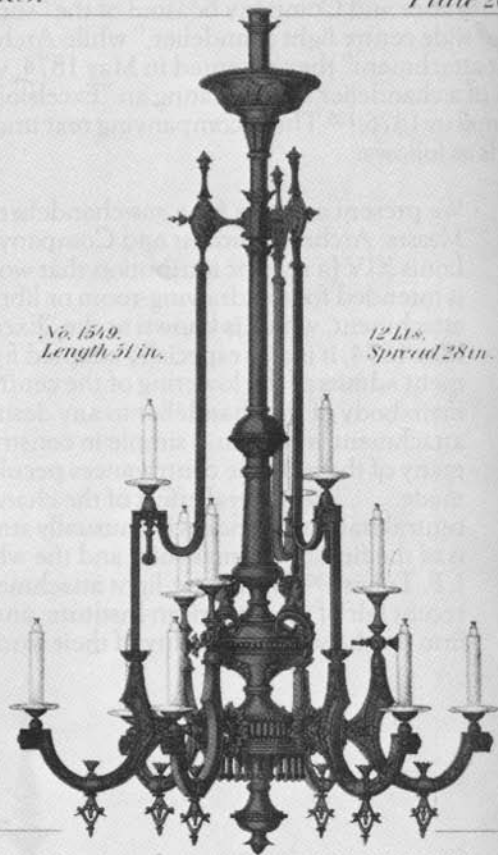
No. 1498.
Length 53 in.

6 Lts.
Spread 34 in.



No. 1549.
Length 51 in.

12 Lts.
Spread 28 in.



Manufactured by K. & E. Rogers Ltd. 111 Market St. N.Y.

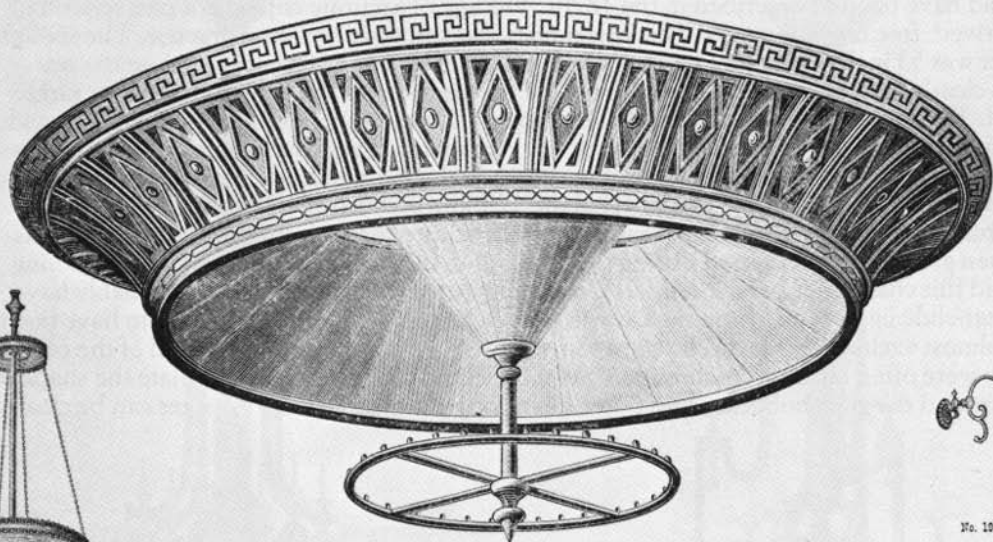
ARCHER & PINCOISE MFG. CO.

MANUFACTORY AND WAREHOUSES

NO. 707 & 708 West 111th Street, NEW YORK.

All the latest and most improved styles of Chandeliers and Reflectors are constantly on hand and made to order.

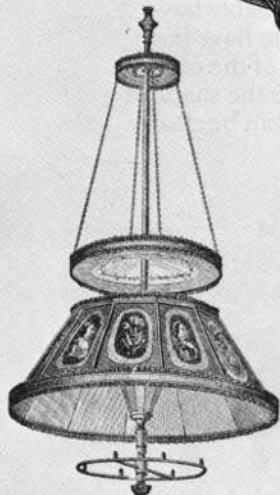
In ordering Reflectors or Chandeliers, send size of room to be lighted, and state if they are to be inserted **IN** or suspended **FROM** ceiling.



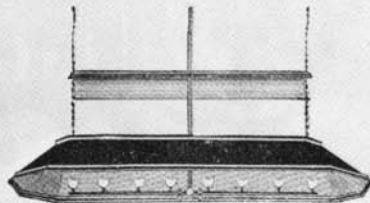
No. 800.—DOUBLE CONE REFLECTOR.



No. 101.—Concave Reflectors.



No. 100.—Ornamental Double Cone Reflector, suspended.
For Stores, Churches, Reading Rooms, &c.,
for Gas or Kerosene.



No. 108.—Octagonal Show Window Reflector.
For Gas or Kerosene.

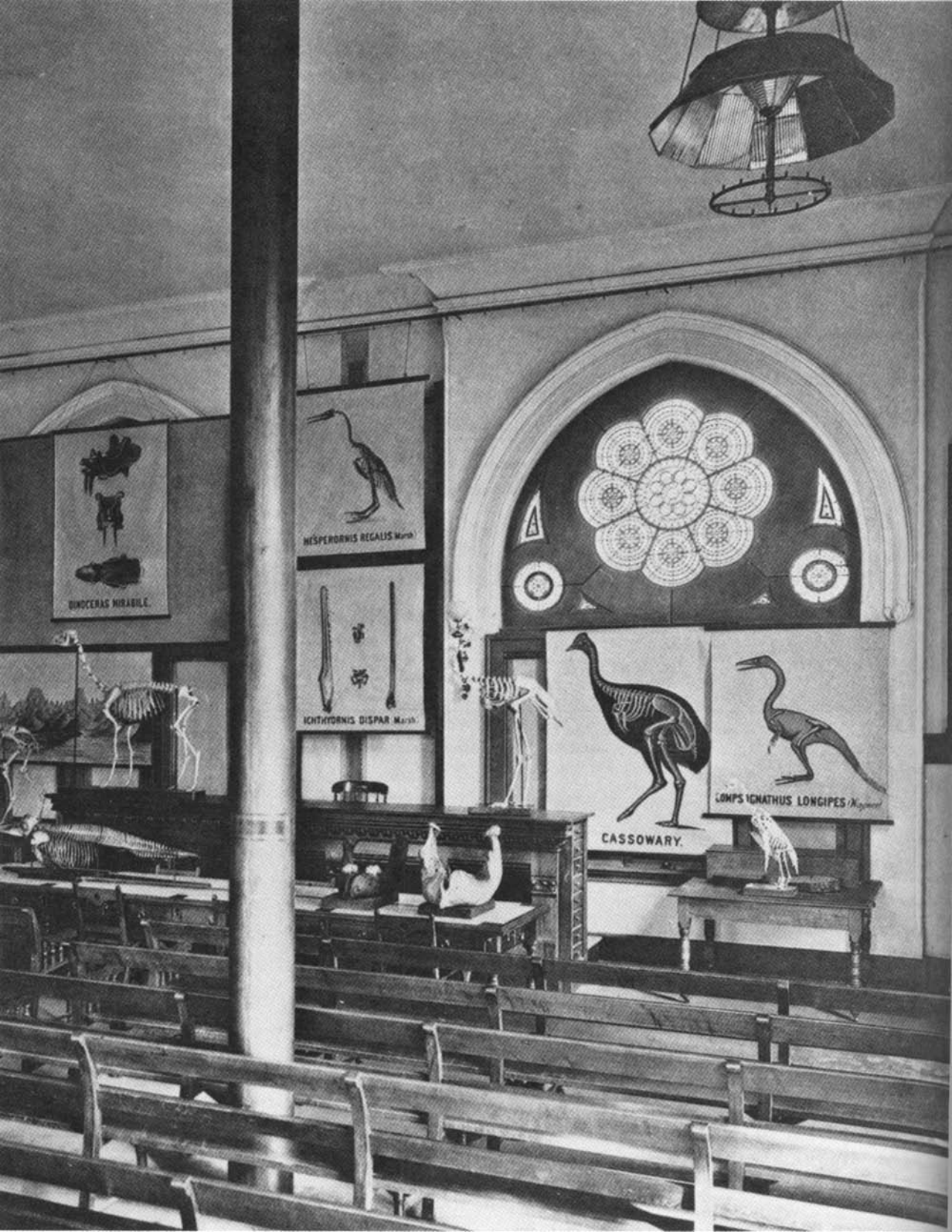


No. 105.—Plain Double Cone Reflector.
For Stores, Windows, &c.,
for Gas or Kerosene.



No. 107.—Octagonal Shade.
Lined with Silver Plated Glass.

ARCHER & PANCOAST MANUFACTURING CO.,
70, 72 & 74 Wooster Street, New York.



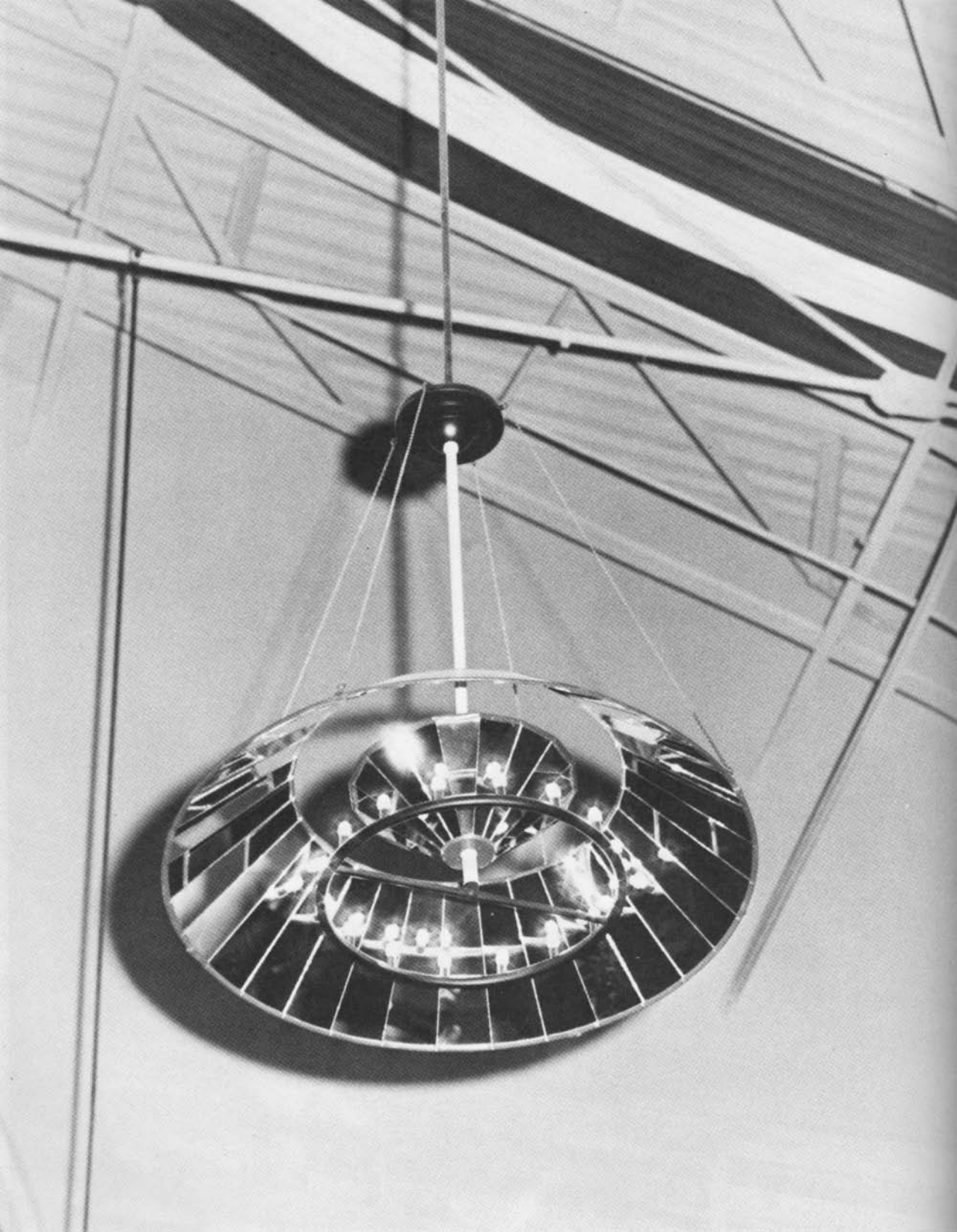
DINOCERAS MIRABILE

NESPERORNIS REGALIS Marsh

ICHTHYORNIS DISPAR Marsh

CASSOWARY

COMPSIGNATHUS LONGIPES (Agassiz)





13255 9

FRANK LESLIE'S ILLUSTRATED NEWSPAPER

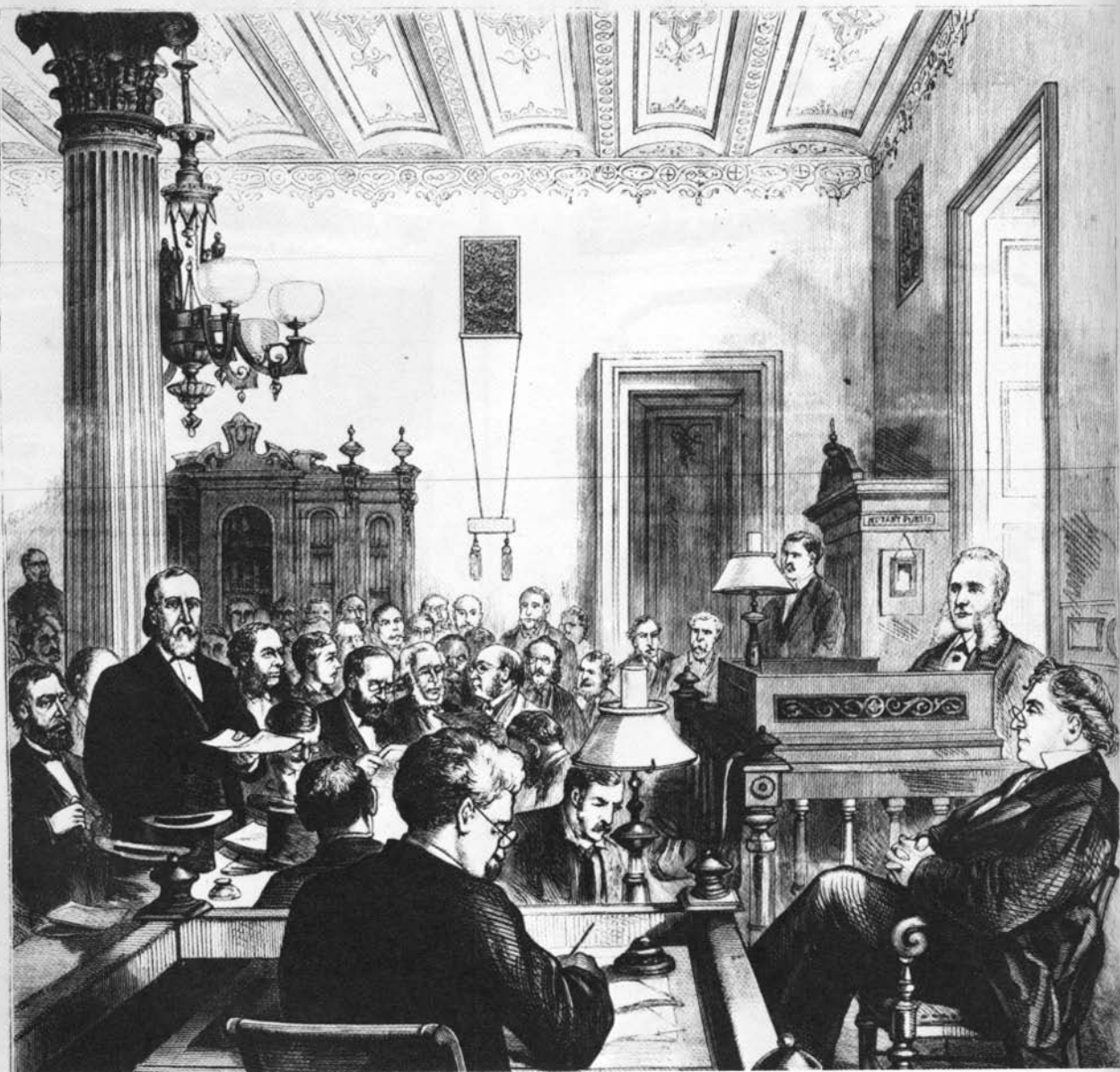
Entered according to the Act of Congress, in the year 1877, by Frank Leslie, in the Office of the Librarian of Congress at Washington.

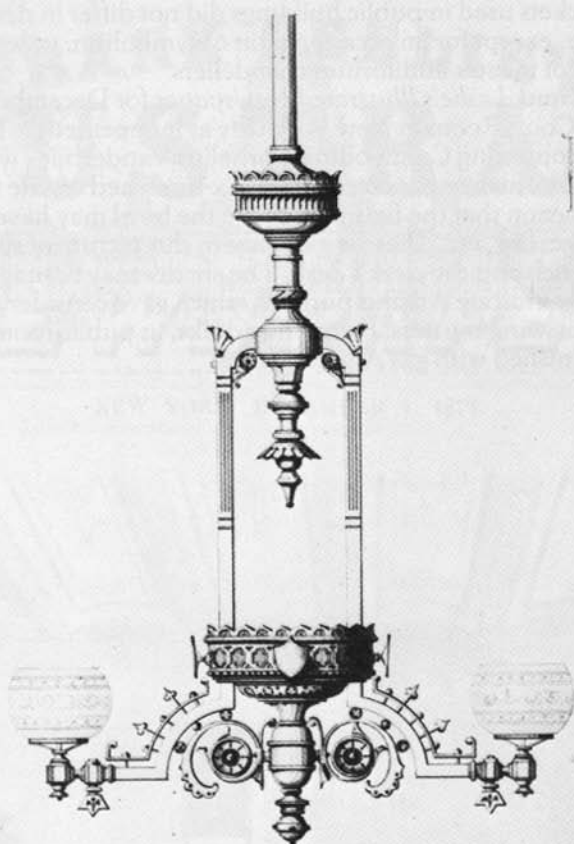
No. 1,197—Vol. XLV.]

NEW YORK, DECEMBER 1, 1877.

PRICE, 10 CENTS.

By AP. TRAVIS.
12 WEEKS, \$1.00.





DESIGN FOR A 2-5-6-LGT.

CHANDLIER

SPREAD 41IN.

Patented

The Lincoln Case.

DESIGNED FOR STATE OF N.Y. & N.Y. DESIG.

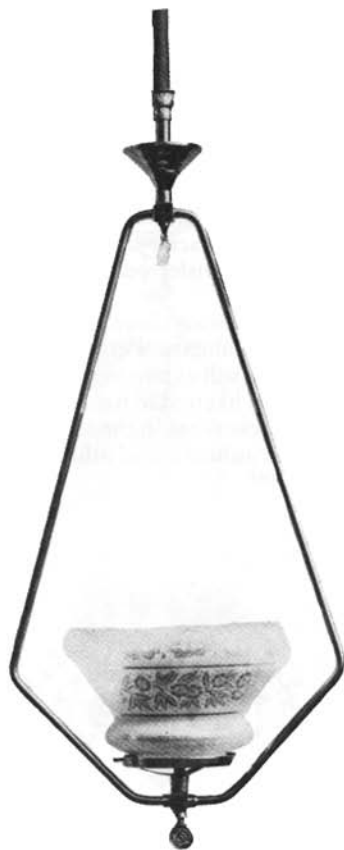
NORTH LANE

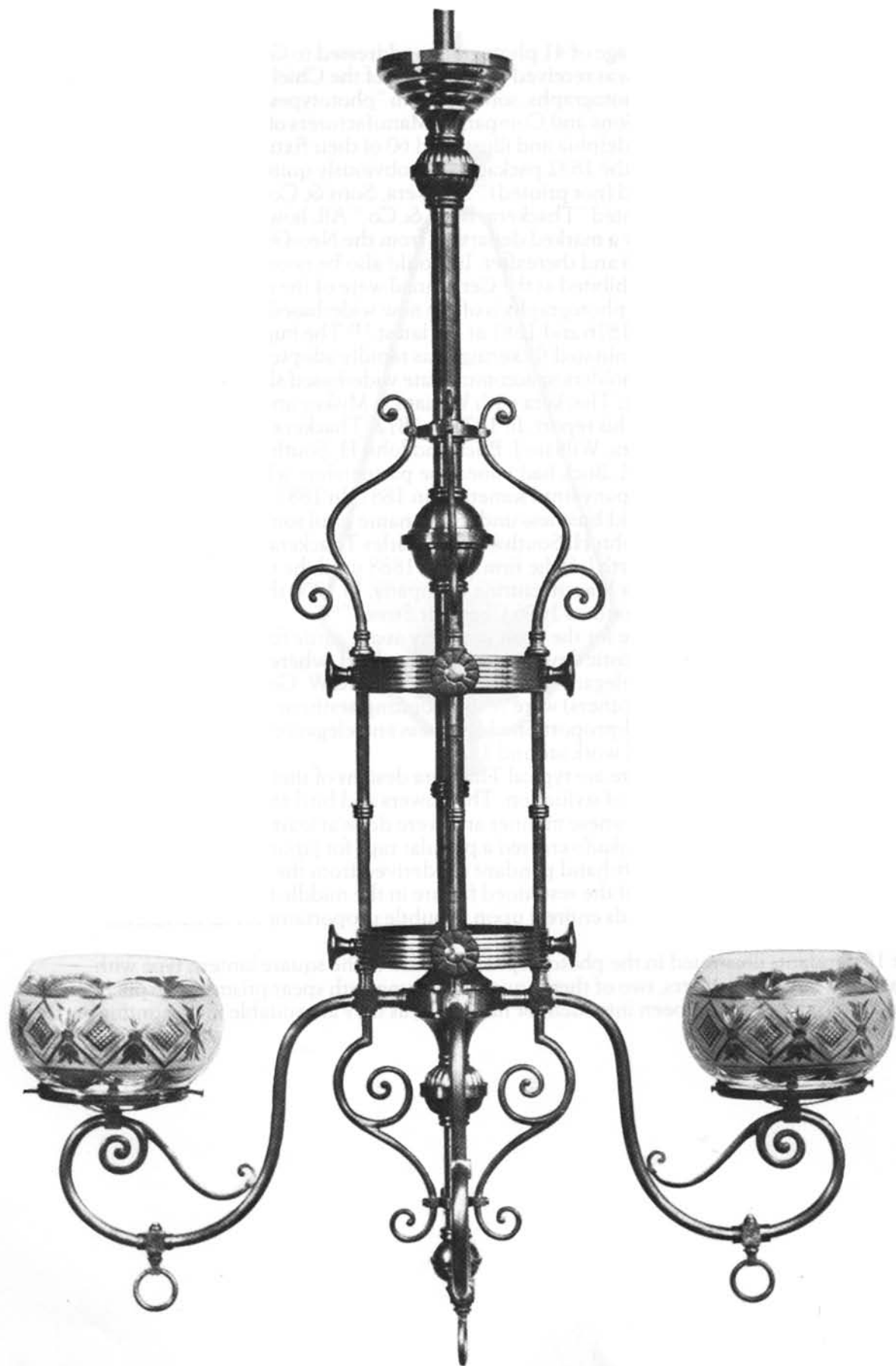
WASHINGTON D.C.

Superior

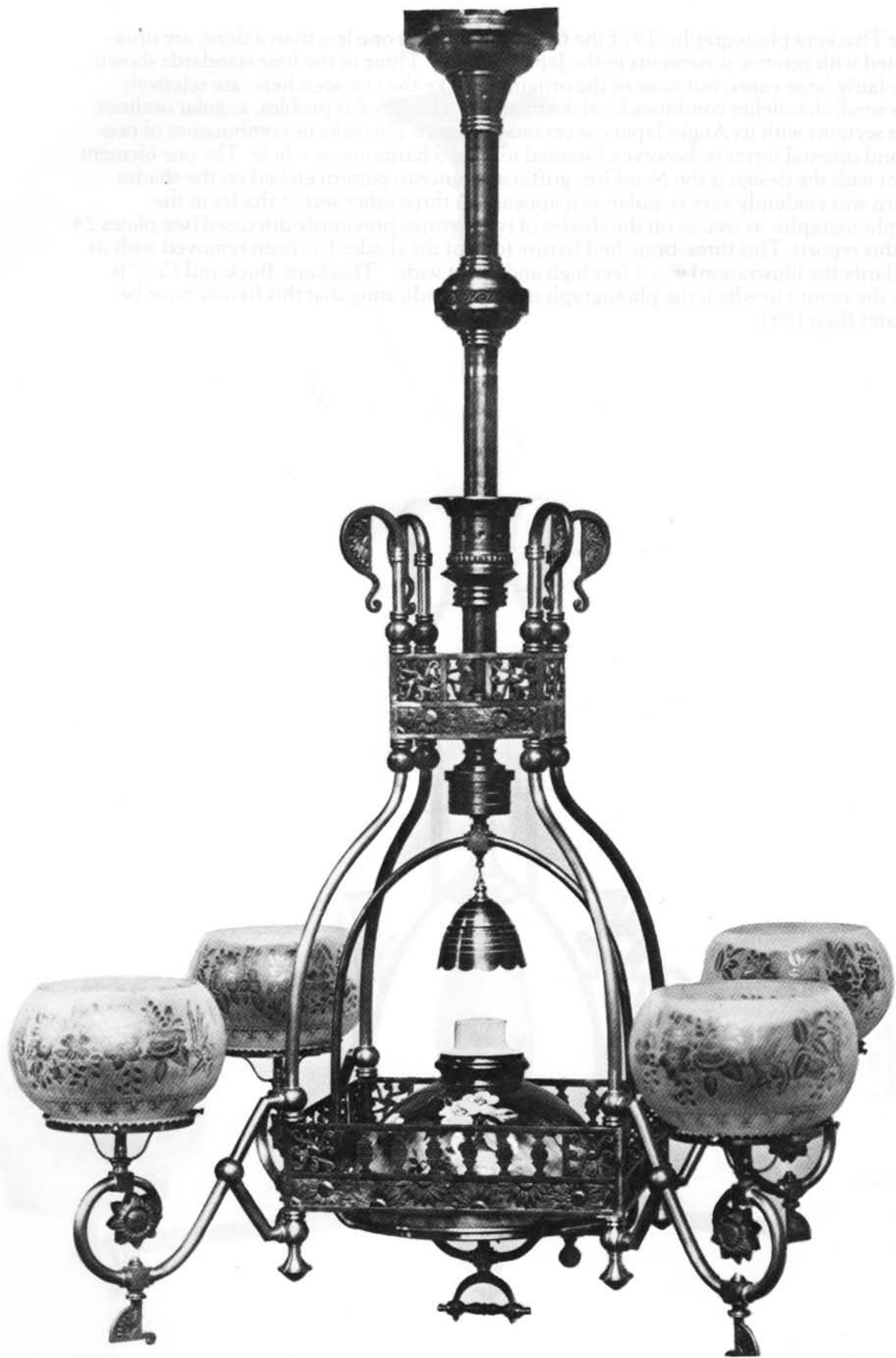
Drawer No. 1,
Sheet 83

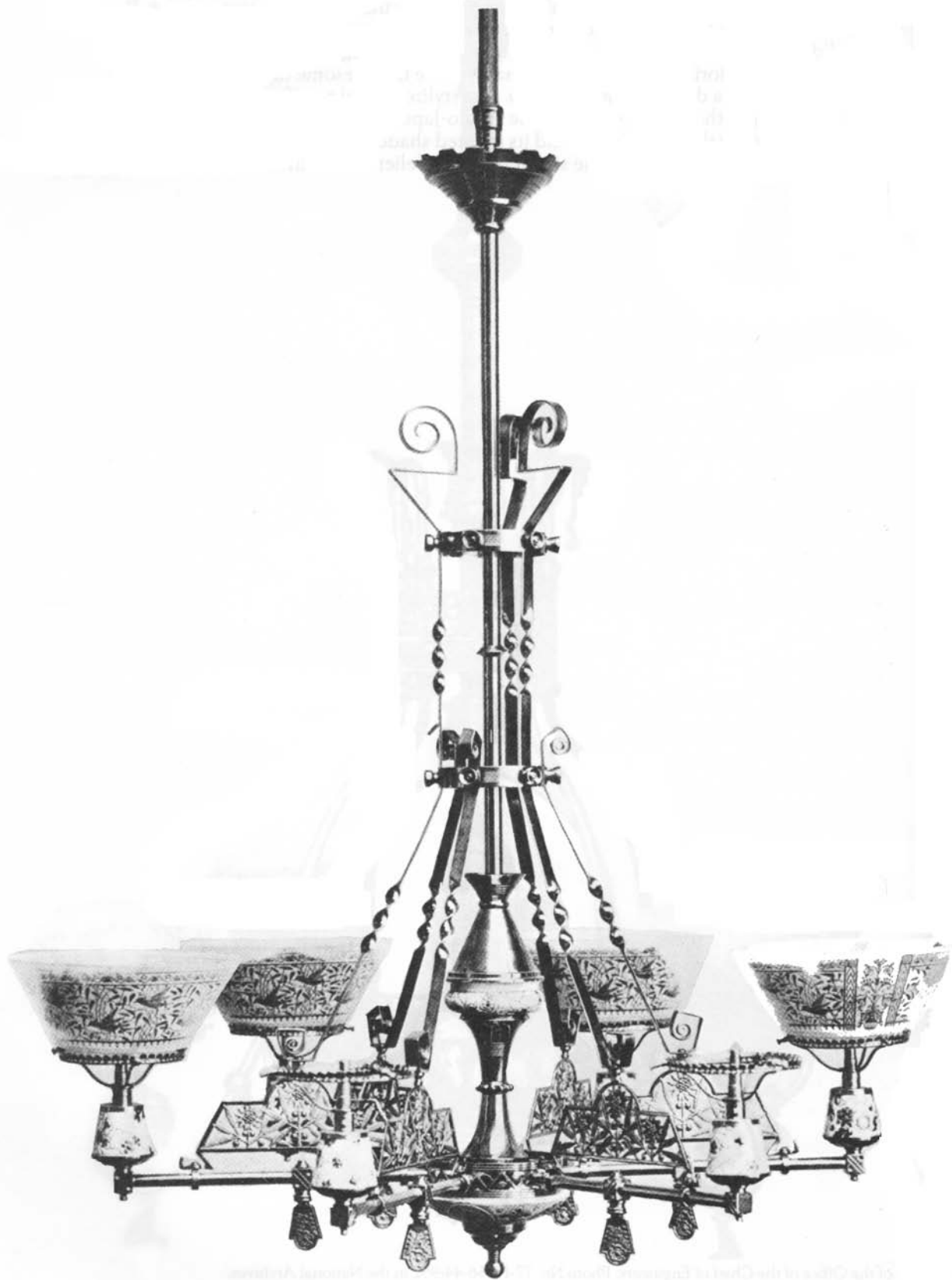
Case No. 2
Folder No. 9
Sheet No. 222

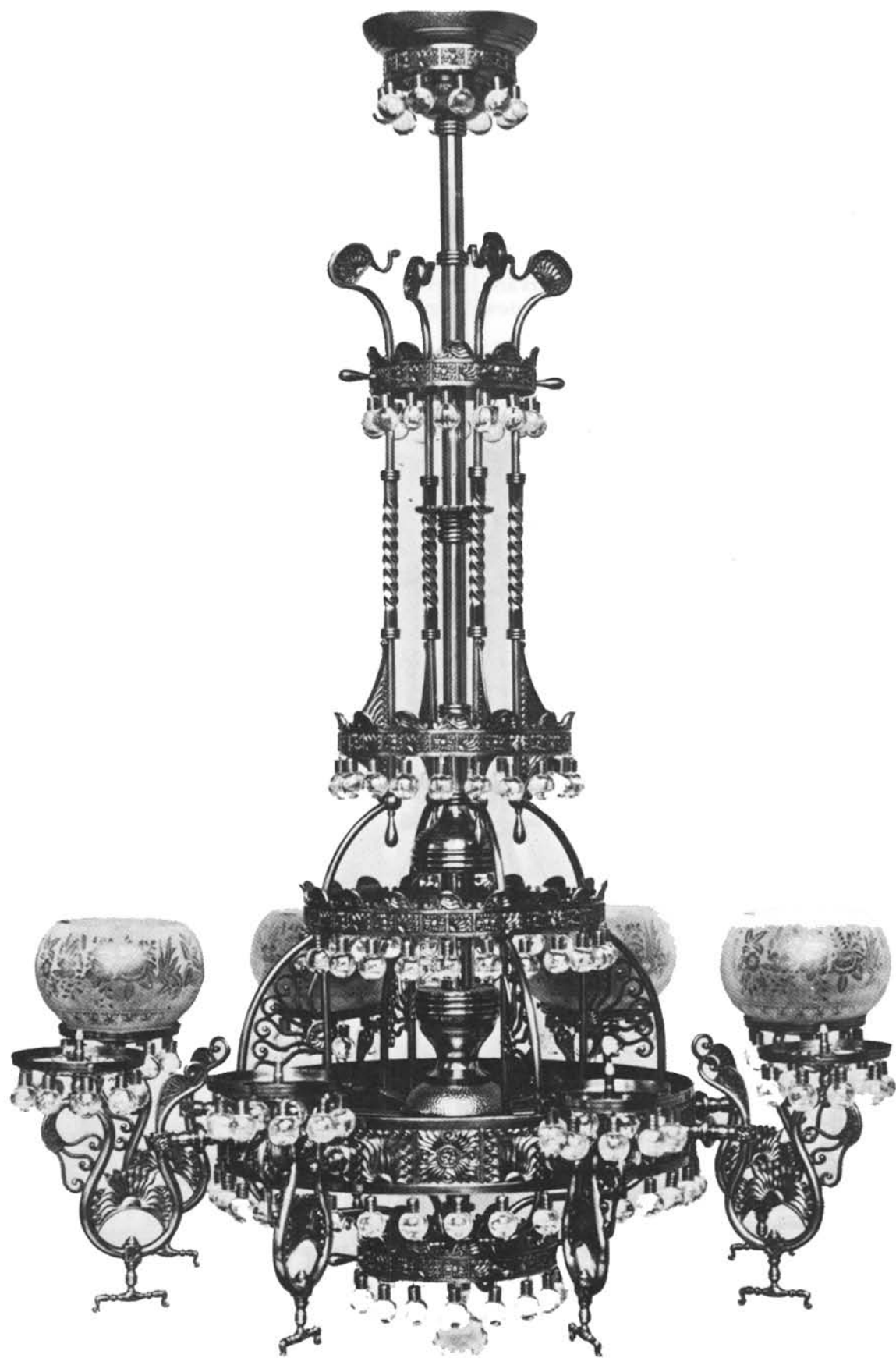












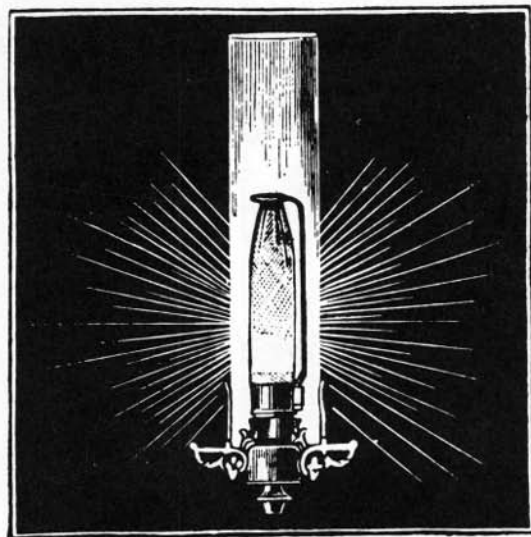


INCANDESCENT GAS LIGHT

(NEW & IMPROVED SYSTEM)

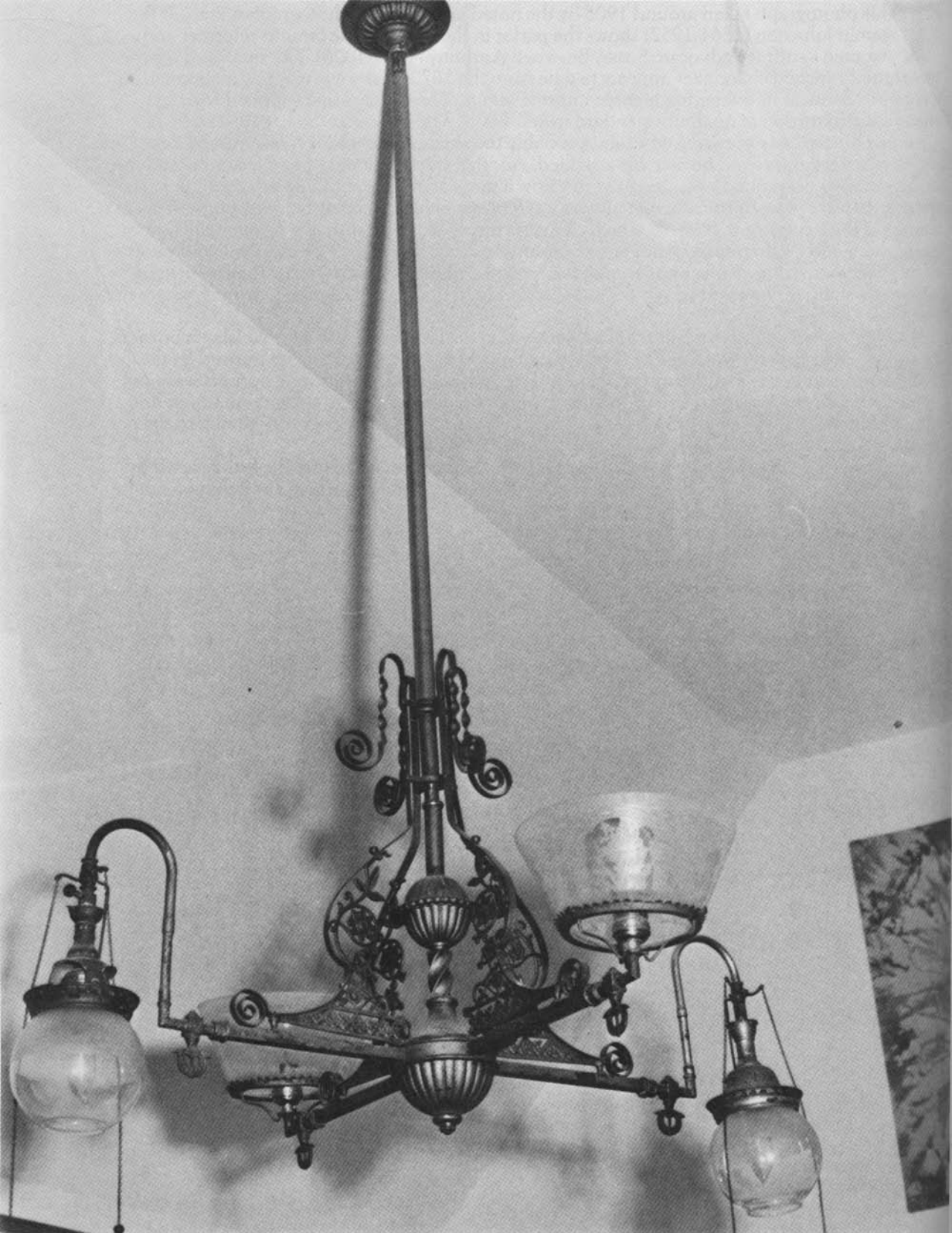
ELECTRIC LIGHT SURPASSED.

All the advantages of Electric Light and none of its drawbacks.



Facsimile of the first advertisement of the Welsbach Light, which appeared in the "Journal of Gas Lighting" for December, 1890.

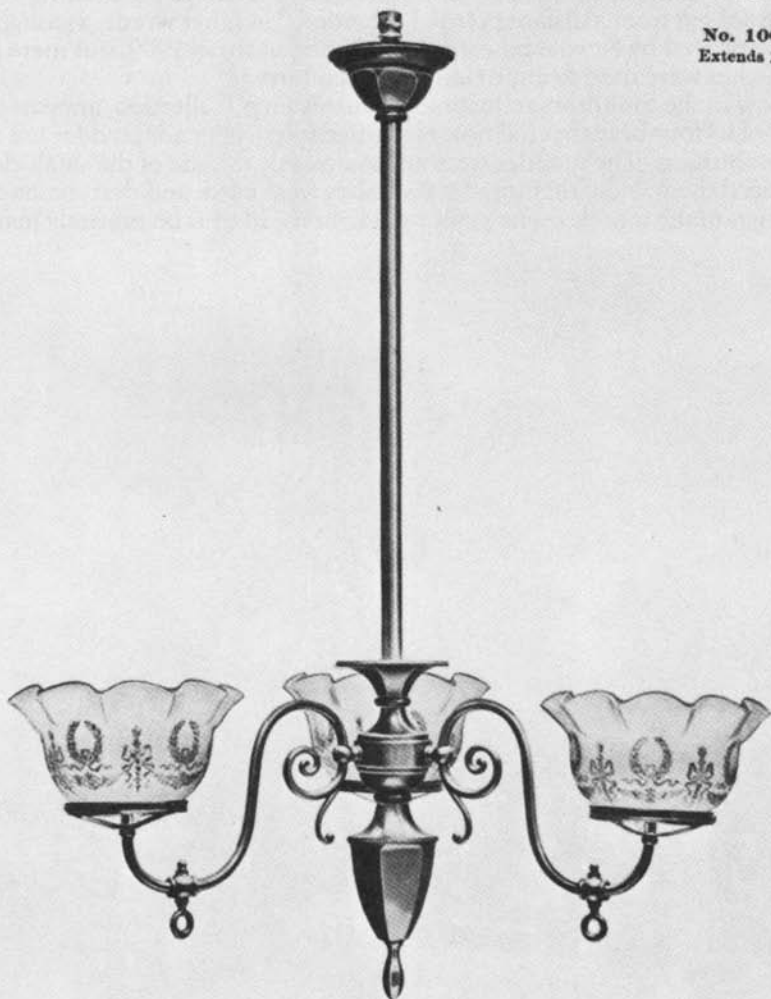




WELIGHT IN WORLD



No. 10040
Extends 11 in.



No. 14607
Length, 36 in.
Spread, 26 in.



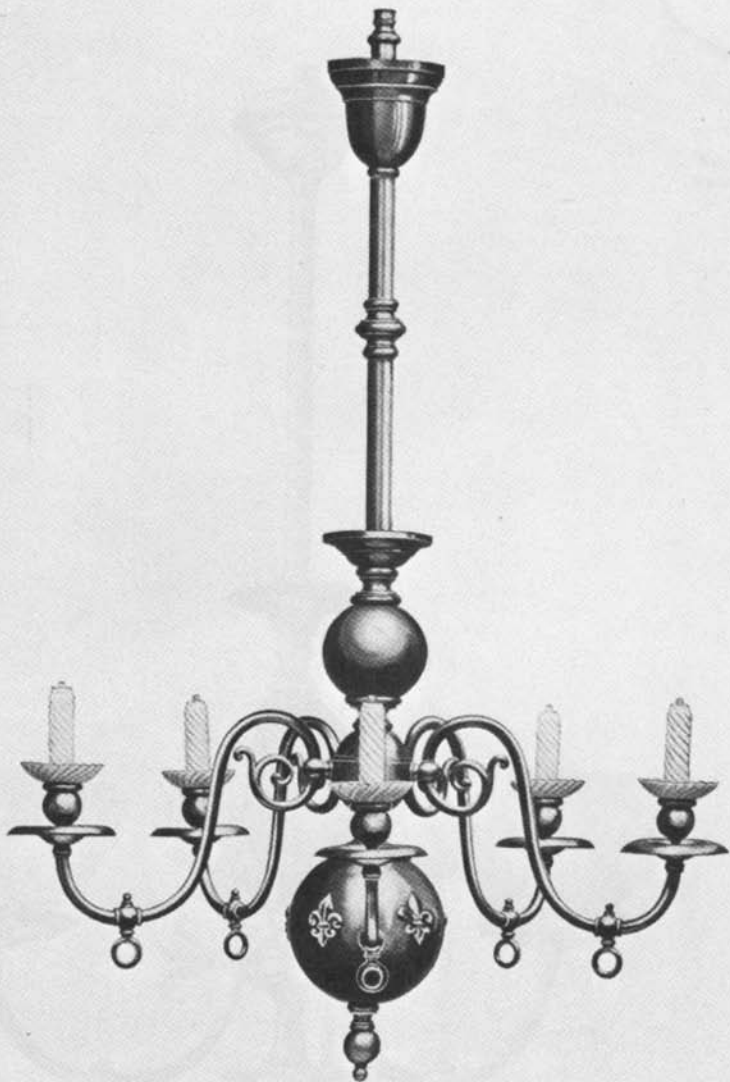
No. 10080
Extends 10 in.



No. 13631

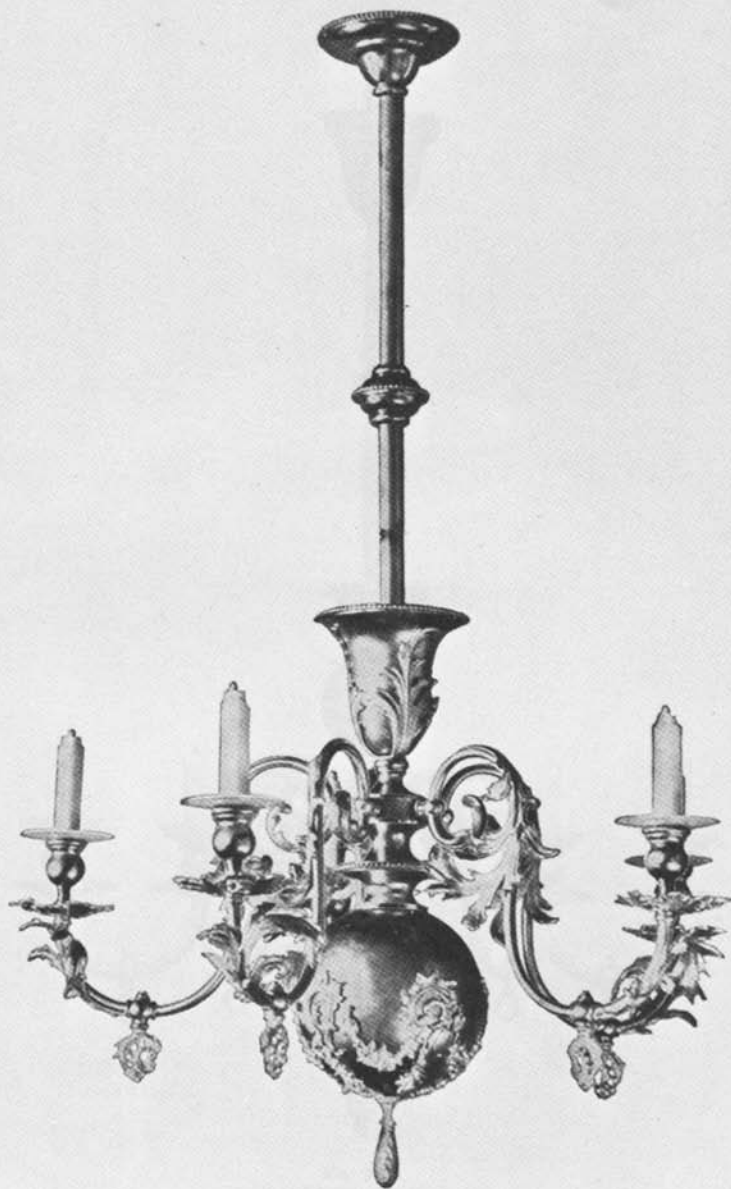
Length, 36 in.
Spread, 18 in.

WE LIGHT THE WORLDTM



No. 116
Length, 42 in.
Spread, 24 in.

"WE LIGHT THE WORLD"



No. 13857
Length, 42 in.
Spread, 22 in.

GAS FIXTURES

LET US SAVE YOU MONEY WHEN YOU BUY YOUR GAS FIXTURES. All we ask is that you make a selection from this catalogue, and after you have received them, if you are not satisfied that you have saved 50 per cent on your purchase, return them to us at our expense and we will gladly refund your money together with all transportation charges both ways.

THE PROFESSIONAL GAS FITTER, PLUMBER OR MECHANIC will do well to buy his fixtures from us. We can save him money and at the same time furnish him with fixtures that will give satisfaction to his customers. Our exclusive designs

cannot fail to please even the most critical and the fixtures have a rich, expensive appearance. **OUR GUARANTEE.** highly polished brass. We guarantee that the fixtures are made of the best quality of material, strong and durable. Every fixture is tested before leaving our house to insure against leakage. We claim our fixtures are superior in quality, finish and durability and we guarantee them to give perfect satisfaction. **NATURAL GAS AND ACETYLENE GAS TIPS.** The prices quoted below are for fixtures fitted complete with tips for artificial or manufactured gas. We can furnish gas fixtures for natural gas at an extra cost of 8 cents for each tip or with acetylene tips for 25 cents each tip.

Swing Gilt Brass Gas Bracket.



Made of excellent quality of brass, in ribbed design. Finished complete with wall plate, pillar, tip, and with one or two arms, either with burner cup or with white crystal glass shade in richly cut design and brass shade holder.

No. 3K2211

Price, per 1/2 dozen, \$2.18; each 37c

No. 3K2203 Single Swing Gilt Brass Gas Bracket with white crystal glass shade and brass shade holder.

Price, per 1/2 dozen, \$3.08; each 53c

No. 3K2210 Double Swing Gilt Brass Gas Bracket with burner cup.

Price, per 1/2 dozen, \$3.48; each 61c

No. 3K2211 Double Swing Gilt Brass Gas Bracket with white crystal glass shade and brass shade holder.

Price, per 1/2 dozen, \$4.45; each 78c

One and Two Light Polished Brass Pendant.

Suitable for kitchen, cellar, back hall and other places where a fancy gas fixture is not necessary. All brass tubing nicely polished, neat and well constructed. Furnished complete with burner cup, pillar and gas tip. No globe or globe holders furnished at prices quoted below.

No. 3K2235 One-Light Pendant, 30 ins. long.

Price 49c

No. 3K2236 One-Light Pendant.

Price 54c

No. 3K2225 Two-Light Pendant, 30 inches long.

Price \$1.15

One-Light Fancy Gas Pendant Polished Brass.

One of the neatest and most artistic pendants on the market. It is made of polished brass with fluted cup and fancy carved leaf ornaments and fancy gas stop cock. The pendant is very well constructed, and is an ornament to any room. Furnished complete with brass ceiling plate, pillar and gas tip and in one length only, 36 inches. We can furnish this pendant either with or without a globe and holder.

No. 3K2234 Fancy Gas Pendant, with burner cup. Price \$1.12

No. 3K2235 Fancy Gas Pendant, fitted with white crystal shade in very rich looking design, and brass burner plate.

Price \$1.23

Hall Gas Fixture.

A very neat and effective fixture for little money. Made of highly polished brass tubing, in graceful design. Comes complete as shown in illustration with ceiling plate, pillar, gas tip, globe holder and fluted ceiling protector hanging over the light. Length of fixture, 30 inches. We can furnish this light with either opalescent or red globe.

No. 3K2245

Price, with opalescent globe \$1.49

Price, with red globe \$2.08

OUR LEADER \$2.39 HALL LIGHT

NEW DESIGN. VERY ARTISTIC. A GREAT BARGAIN.

THIS BEAUTIFUL FIXTURE is made of solid brass tubing, very highly polished with heavy weight brass ornamentation. We consider this fixture the greatest value in hall lights ever offered for the money.

A HANDSOMELY EMBOSSED CROWN is fitted around the top of the globe. On either side of the frame, just above the light, a wrought brass projects a gracefully designed. A fluted ceiling protector hangs over the light, while above it is a center ornament in the form of a brass cup, and above that the brass ceiling plate. The globe is of opalescent glass, fluted in a graceful design cylinder shape. An openwork key to turn on and off gas completes the light.

THIS HALL FIXTURE IS FURNISHED COMPLETE with globe, brass holder, pillar, lava gas tip and ceiling plate, just as shown in the illustration. The fixture, when you receive it, is all complete and ready to screw into ceiling. Bear this in mind. Our price is for the fixtures complete. It includes all the parts.

No. 3K2255 Our Leader Hall Gas Fixture, just as described above. Price \$2.39

No. 3K2256 Our Leader Hall Gas Fixture, just as described above, but with transparent red globe. Price \$3.18

"The Star" Gas Chandelier. Made of highly polished brass with exceedingly attractive ornamentation. Consisting of a fancy fluted ball ornament and pear shaped pendant. The curved arms project from this ring and have cast brass ornaments in dull finish. Fitted complete, as shown in the illustration, with beautiful beveled crystal glass shades, ornamented with cut stars. It is also fitted with brass shade holders, pillar, lava gas tip and ceiling plate, can furnish with two or three lights. Length of fixture, 36 inches. Spread of arms, 19 inches.

No. 3K2275 Two-light fixture. Price, \$2.89

No. 3K2276 Three-light fixture. Price, \$3.88

No. 3K2280 Two-light fixture. Price, \$3.35

No. 3K2281 Three-light fixture. Price, \$4.50

Imperial Gas Chandelier.

A well made finely finished chandelier and exceedingly attractive to look at. It has a graceful design, being made of extra fine brass tubing, highly polished, with fluted cup, pear shape ornament. Around the center of the pear shape ornament runs a beaded band, from which project the arms. The arms are in graceful descending curves with solid cast brass ornaments in fern design. The delicately etched shades add greatly to the beauty of the chandelier. This fixture can be furnished with two or three lights and comes complete with etched shades, brass shade holders, pillar, lava gas tip and ceiling plate.

No. 3K2282 Our Leader Chandelier, with FOUR lights. Price \$5.19

48 PEERLESS GAS PORTABLE LAMP.



Gilt Gas Chandelier.

For people desiring a low price fixture this is just what they want. Made of polished brass, corrugated design with brass ball ornament in satin finish and artistic loop design. Furnished with two or three lights. Length of fixture, 36 inches. Spread of arms, 19 inches. Remember the prices quoted below are for the fixtures complete with crystal glass globes in rich design, brass shade holders, pillar, lava gas tip and ceiling plate, all complete and ready to put up.

No. 3K2265 Two-light fixture. Price, \$1.78

No. 3K2266 Three-light fixture. Price, \$2.38

OUR SPECIAL EXTRA VALUE LEADER CHANDELIERS

Solid Heavy Brass Tubing, Highly Polished, Elaborately Ornamented, Satin Finish Trimmings.

EXQUISITE IN DESIGN AND DETAIL. Do not be deceived by the price we ask for this chandelier. The only thing cheap about it is the price.

WE GUARANTEE THIS FIXTURE to be of the best materials. It is made of heavy brass tubing, very highly polished. Part of the tubing is corrugated, giving the fixture a very rich appearance. The ceiling plate and ceiling plate is ornamented with a fluted cup in satin finish surmounting a ball with beaded band and large pineapple shaped pendant. The pendant is extra large and elegant, and has attached to it at the bottom a fluted ball in satin finish brass. From this ball five heavy cast brass leaves reach up and are apportioned to the pendant. A ribbed band of satin finish brass surrounds the pendant, from which band project the arms, which have a graceful downward curve and are ornamented with heavy solid cast brass ornaments in dull finish. The keys are fanny openwork in the same finish.

THE CHANDELIER IS FITTED

complete with fluted brass ceiling plate, pillars, best quality of lava gas tips, brass shade holders and beautiful new oval shape silver frosted shades, with embossed edges and angel design, having delicate tracery work etched around the center. Elegant parlor, library or dining room chandelier.

No. 3K2295 Our Leader Chandelier, with TWO lights. Price \$4.18

No. 3K2297 Our Leader Chandelier, with THREE lights. Price \$5.19

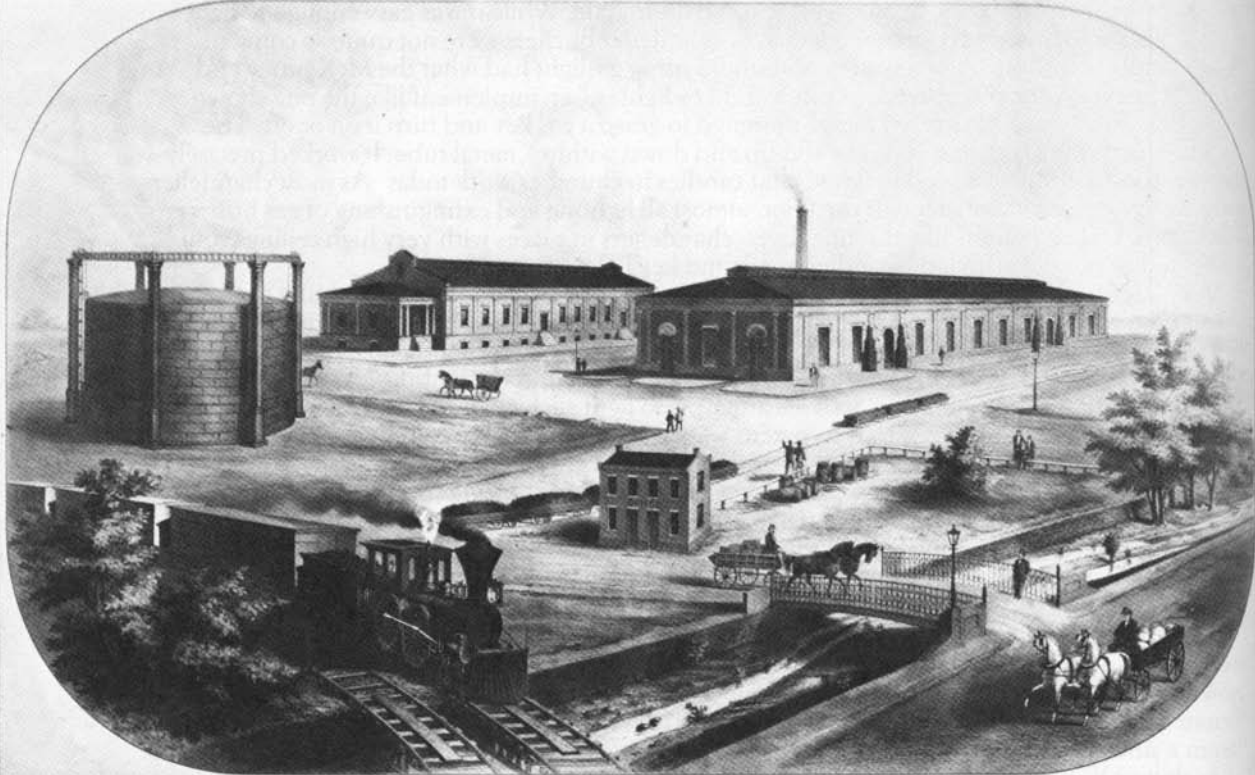
No. 3K2298 Our Leader Chandelier, with FOUR lights. Price \$6.15



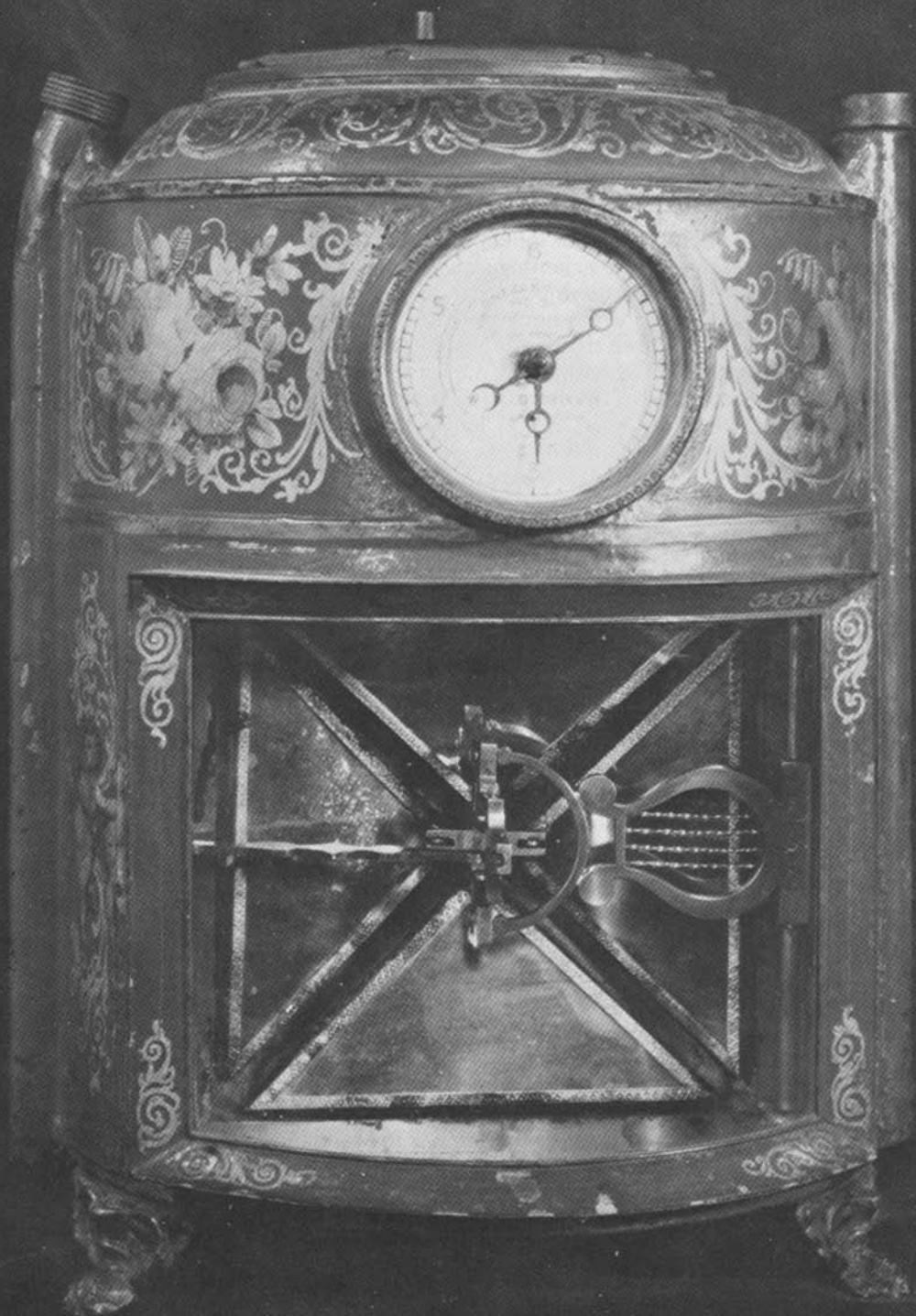








THE WORKS OF THE PEOPLES GAS COMPANY OF BALTIMORE.









FORD'S
THEATRE







