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**Lehigh University  
Library & Technology Services**

# Special Collections

## *Flyer*

## STRUCTURE

Lehigh's Special Collections is developing a collection in the history of building technology, particularly bridges, of the 19th and early 20th centuries. We aim to make it one of the most comprehensive in the world.

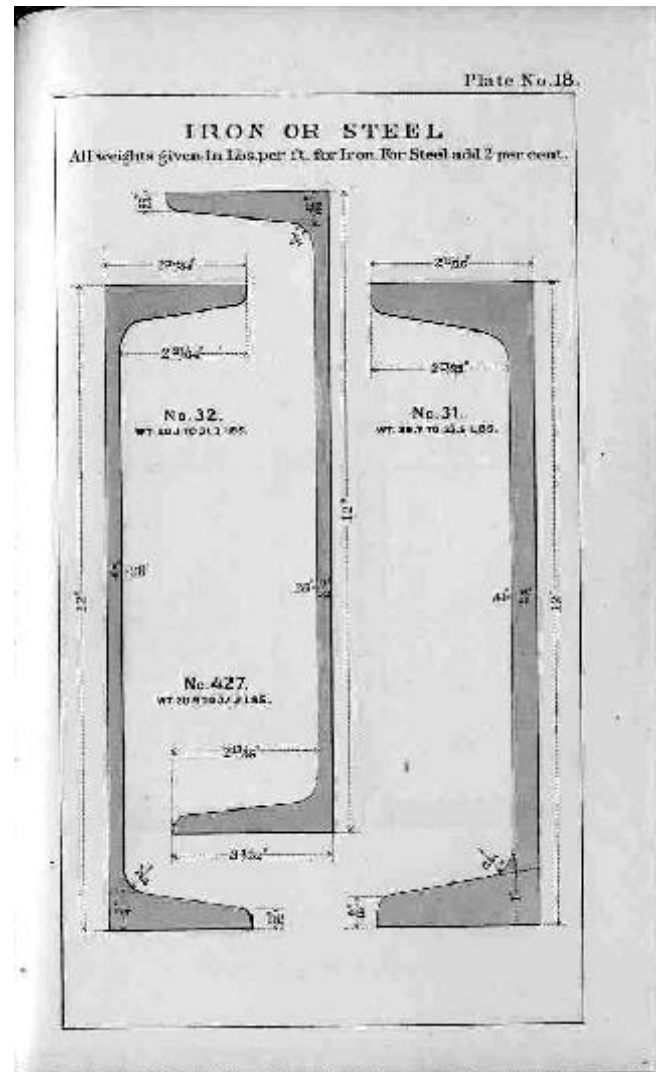
The basic metal used for construction during this period was iron, initially, and then steel at the end of the 19th century. The use of these materials to fabricate structural members has its own history, which is reflected in the handbooks and pocket companions issued by the rapidly expanding mills, beginning in the 1860s.

It's become clear that a collection of these handbooks, which were issued mostly as pocket-sized volumes for the use of engineers and builders in designing various kinds of structures, is essential to providing a complete understanding of the building technology of the period. We have labeled these small volumes "structural shape books" because they typically represent structural members by their cross-sectional shape.

The purpose of these books was to give an engineer or builder all the information necessary to select the appropriate structural members for a

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project. The core of all of these consisted of cross-sections of wrought iron or steel beams, plus data on dimensions, weight and load-bearing capacities of the particular item.



Pencoyd Iron Works, 1892

The Phoenix Iron Works, a Philadelphia-area mill which was one of the most important in the country, issued its first catalog in 1869. We don't own an original of this extremely scarce item, but do have a digital copy from another library. The next Phoenix catalog, undated, but from the early 1870s, is the earliest American example in the collection.

Other mills, both large and small, quickly followed suit. Many of these were, or still are, located in Pennsylvania: Carnegie, Phoenix, Pencoyd and Cambria are only the most important.

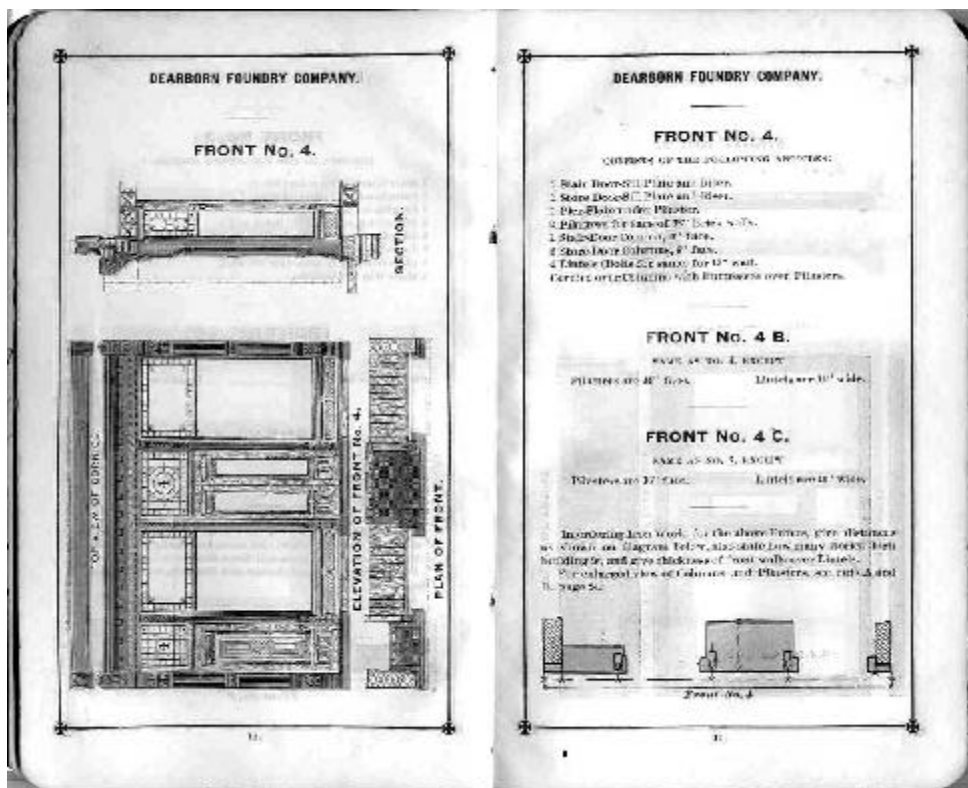
In several volumes included in our 30-volume digital collection of historical bridge materials (<http://bridges.lib.lehigh.edu>) we found references to Carnegie's "Pocket Companion" and the

appropriate edition will soon be added to the site. The early ones depicted wrought iron exclusively; as

the earliest American example in the collection is one from the Phoenix Iron Works, near Philadelphia. In the days before steel, the firm patented, and sold very successfully, a set of curved, boltable shapes which, when assembled, made cylindrical beams of several diameters for use in constructing buildings, bridges, etc. This system is beautifully documented in their early catalogs.

The collection currently numbers almost 60 of these structural shape books. A full current list can be obtained by entering the phrase "structural shape book" in the "Anywhere" box in the library's online catalog "ASA."

Our interest encompassed the earliest examples, up to World War II. Since there is no bibliographical study of these books, it's not known how many were issued throughout the world, but a figure around 200 would not be surprising. Incidentally, there is little competition in collecting these, except for a few such as the Dearborn example, which has an architectural or regional crossover. —P.A.M.



Dearborn Iron Foundry, 1887

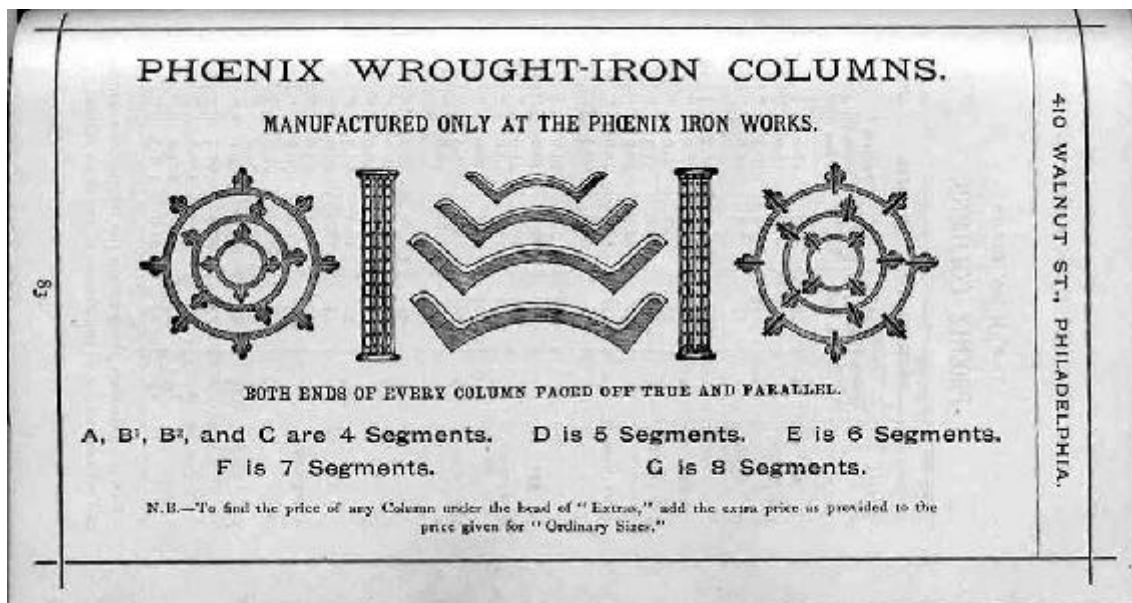
steel became available in the 1880s, the manuals made the transition, first showing iron and steel together, and then by the late 1890s, steel alone.

Almost without exception, the volumes were between six and seven inches tall, and rather narrow, to accommodate the user's pocket. Carnegie even called theirs a "Pocket-Companion." Volumes generally made judicious use of color to highlight the shape of the beam or other features of interest. The Dearborn Iron Foundry of Chicago, for example, offered ten predetermined cast-iron store fronts. The illustrations indicated, through color-coding, what part of the store front came in the kit, and what the local carpenter had to supply in wood.

Other catalogs listed, in addition to various beams and girders, floor and roof members, and cast-iron building accessories.

As mentioned already,

*Please contact Special Collections at 8-4506 or inspc for further information. The reading room, the Bayer Galliera of Rare Books, is located on the third floor, west side, of Linderman Library.*



Phoenix Iron Works, ca. 1872