Plate Book for
A Chronology of
Typographical Pantographs
About this Book

This book contains collection of larger images to accompany “A Chronology of Typographical Pantographs” by Dr. David M. MacMillan.

In earlier eras of printing a separate “plate book” such as this would have been required when the images were best reproduced using a technology differed from that of the main text (copper or steel engravings, for example, or collotypes, or color lithographs). In our present brief era, we have returned to the need for plate books because of the mismatch between computing power and image file size. It is in any case convenient to keep larger images separately so that they do not interrupt the flow of the text.

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Plate 1. A Drafting Pantograph

This is a conventional pantograph intended for use in mechanical drawing. The version shown here is from a 20th century catalog of drafting equipment. The basic framework of bars has been characteristic of the true pantograph since its invention in the 17th century. The style shown here adds a suspension mechanism to keep the pantograph cleanly above your drawing. The model shown, equipped with wooden bars, was the simplest suspended pantograph offered in this catalog.

Plate 2. A Portrait Lathe (Bergeron, 1816)

This is the earliest illustration (of which I am aware) of a single-arm pantographic “portrait lathe.” Bergeron attributes it to Hulot fils. The pantographic arm is the upper (longer) diagonal arm. What appears to be a lower arm in the side view is potentially confusing; it is in fact a spring, not an arm.

(It is interesting to note that outside of this illustration no examples of the work of the portrait lathe are shown in this book. The portrait of Bergeron’s Plate LI, Figs. 16 & 20 were produced on a rectilinear machine. The medallion of his Plate XIV, Fig. 12 was produced by pressing.)


This is the volume of plates to accompany the second edition of this work. The first edition (1792) was written by Louis-Georges-Isaac Salivet and published under the name of L.-E. [Louis-Eloy] Bergeron.

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Plate 3. A 3-D Sculpturing Machine (Kennan, 1862)

This is a mid-19th century single-arm pantograph implemented as a “machine for copy-ing sculptures in ivory, wood, alabaster, etc., to any scale, either from relievos or rounds.” Shown at the 1862 International Exhibition (London).

https://books.google.com/books?id=19EOAAAYAAJ
Plate 4. A Hollerith Pantographic Tabulating-Card Hand Punch

A single-arm pantograph constructed as a hand punch for punching tabulating cards for the United States census. Patented by Herman Hollerith (shown at right) in 1892 (filed 1891). This photograph of a punch in use was taken in 1940.

This is perhaps the clearest illustration possible of the distortion inherent in the single-arm style of pantograph. (Compare the curved template for the stylus to the rectangular grid of holes punched in the tabulating card.)

Source: Photograph of a punch by the United States Census Bureau. [https://www.census.gov/library/photos/card_punching_1940.html](https://www.census.gov/library/photos/card_punching_1940.html)
Photograph of Hollerith from the United States Census Bureau. [https://www.census.gov/history/www/sights_sounds/photos/1890_photos.php](https://www.census.gov/history/www/sights_sounds/photos/1890_photos.php)
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Plate 5. Gorton 3-D Industrial Pantographs (1937)

These are industrial four-bar pantographs for three-dimensional work such as die-sinking. The third dimension is provided by a proportional system separate from the main pantograph; Gorton later termed this their “ratiobar” system.

The machine on the catalog cover (left) is a Gorton model 3-L. The one on the right is the slightly smaller model 3-B. The 1948 American Type Founders film Type Speaks! shows this model, stripped of its 3-D equipment, used to cut 2-D working patterns.

The smaller image at right shows a die for stamping a spoon, made using one of these pantographs.

Plate 6. Marcus' Geared Pantograph (1855)

A geared “storchenschnabel” (that is, pantograph) by the Austrian inventor Siegfried Marcus. Dated by the photographer to 1855.

While I don’t know that this particular design saw much use, it is a particularly clear example of how to make a proportional device using mechanisms other than the four-bar and single-arm types of pantographs.

Source: A photograph by Wikimedia Commons user “newfoundlanddog” taken on July 2006 and entitled “Storchenschnabel nach Siegfried Marcus, 1855.”
https://commons.wikimedia.org/wiki/File:Pantograph_1855.jpg
Released by the photographer into the public domain.
Plate 7. An Electric Railway “Pantograph”

The device shown about is commonly called a “pantograph” when discussing electric railways and trams. However, it is completely unrelated to the pantographs discussed in this chronology. Its mechanism is different, and its purpose is different. It’s really just a (well engineered!) conductive spring.

Here it is shown on an electric train of the Swiss Schynige Platte Railway.

Plate 8. The First Pantograph, Shown in 1631

The four-bar pantograph invented by Christoph Scheiner, as shown by him in his *Pantographice seu Ars Delineandi Res...* of 1631, on p. 29.
Plate 9. “Turning Machine for Copying” (Italy, 1711)

This photograph by and of a machine in the collection of the State Hermitage Museum, St. Petersburg, Russia, shows what appears to be a medallion lathe. Inventory No. ЭРТх-648. They date it to 1711, from Florence, Italy.

At present I know nothing else about this machine, and am not yet aware of any scholarly study confirming its date, place of origin, or principles of operation.

Source: This photograph is Copyright © by The Russian State Hermitage Museum and is licensed by them for noncommercial “personal, educational and information purposes.” Please respect the terms of their licensing. The original image is online at: https://www.hermitagemuseum.org/wps/portal/hermitage/digital-collection/08.+applied+arts/495389
Plate 10. Nartov’s Portrait Cutter Type 2 (1721)

This photograph is of a surviving Nartov lathe at The State Hermitage Museum, St. Petersburg. Inventory No. ЭРТп-1531. It seems very like the one he described in his manuscript Ясное зрелище машин (“A Clear View of Machines,” aka Theatrum Machinarum) as his “Portrait Cutter Type 2.”

The portrait on the right is of A. K. Nartov.

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www.hermitagemuseum.org/wps/portal/hermitage/digital-collection/01.+paintings/338725
Plate 11. Condamine’s Rosette Generator (1734)

This is not a pantograph, nor even a copying instrument per se. It is a device for transforming an arbitrary figure (such as the silhouette of a human head) into a series of curves which might be used to make a rosette for the type of ornamental turning lathe known as a “rose engine.” This rosette would then allow the lathe to produce the original figure.


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