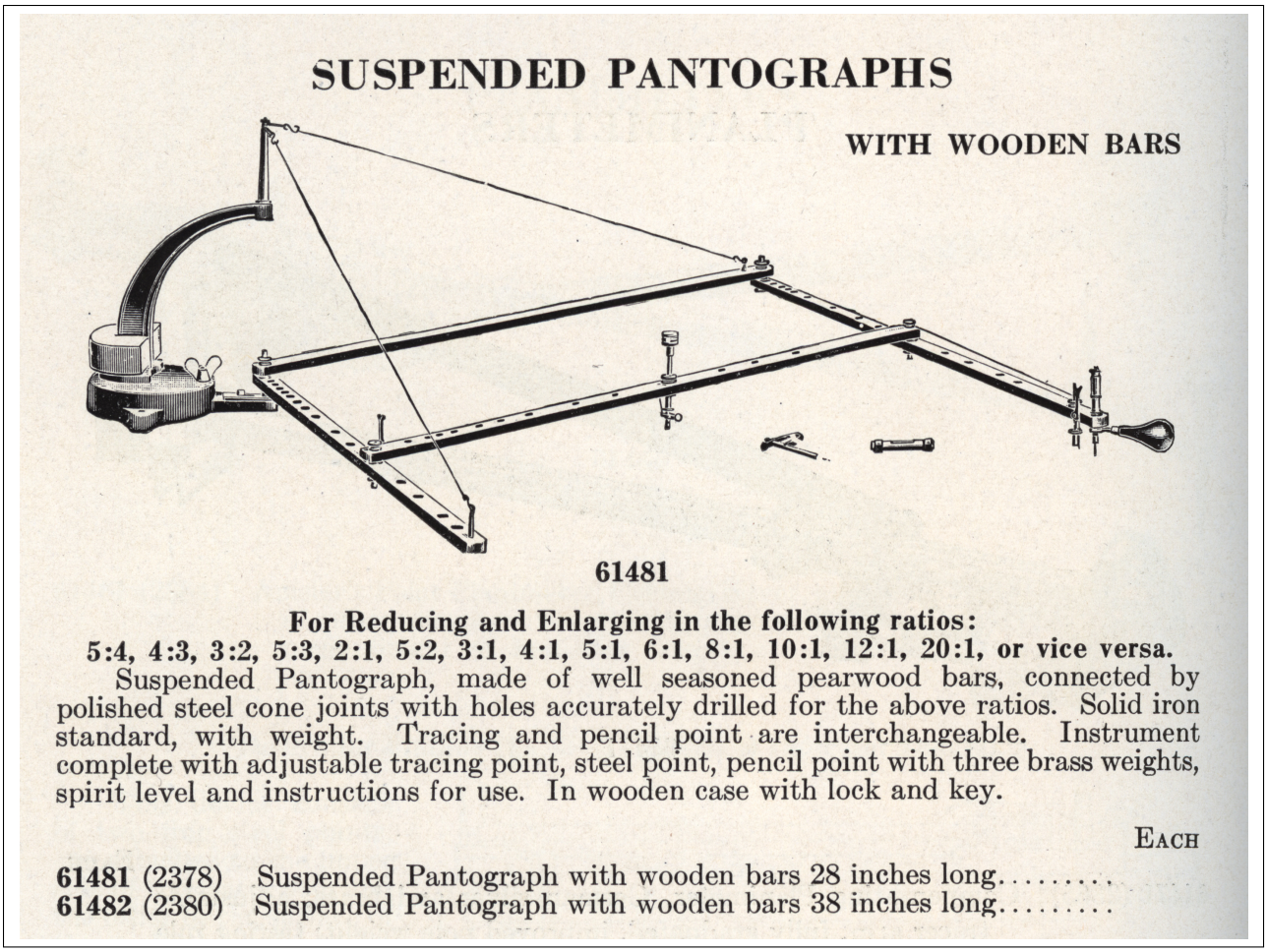
Plate Book for
A Chronology of Typographical Pantographs

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.



SUSPENDED PANTOGRAPHS

WITH WOODEN BARS

61481

For Reducing and Enlarging in the following ratios:
5:4, 4:3, 3:2, 5:3, 2:1, 5:2, 3:1, 4:1, 5:1, 6:1, 8:1, 10:1, 12:1, 20:1, or vice versa.

Suspended Pantograph, made of well seasoned pearwood bars, connected by polished steel cone joints with holes accurately drilled for the above ratios. Solid iron standard, with weight. Tracing and pencil point are interchangeable. Instrument complete with adjustable tracing point, steel point, pencil point with three brass weights, spirit level and instructions for use. In wooden case with lock and key.

EACH

61481 (2378) Suspended Pantograph with wooden bars 28 inches long.....
61482 (2380) Suspended Pantograph with wooden bars 38 inches long.....

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.

Source: *Catalog and Price List* No. 6. (Pittsburgh, PA: B. K. Elliott & Co., [undated, with 1943 price list in back pocket]): 148. Scanned by the author. Public domain.

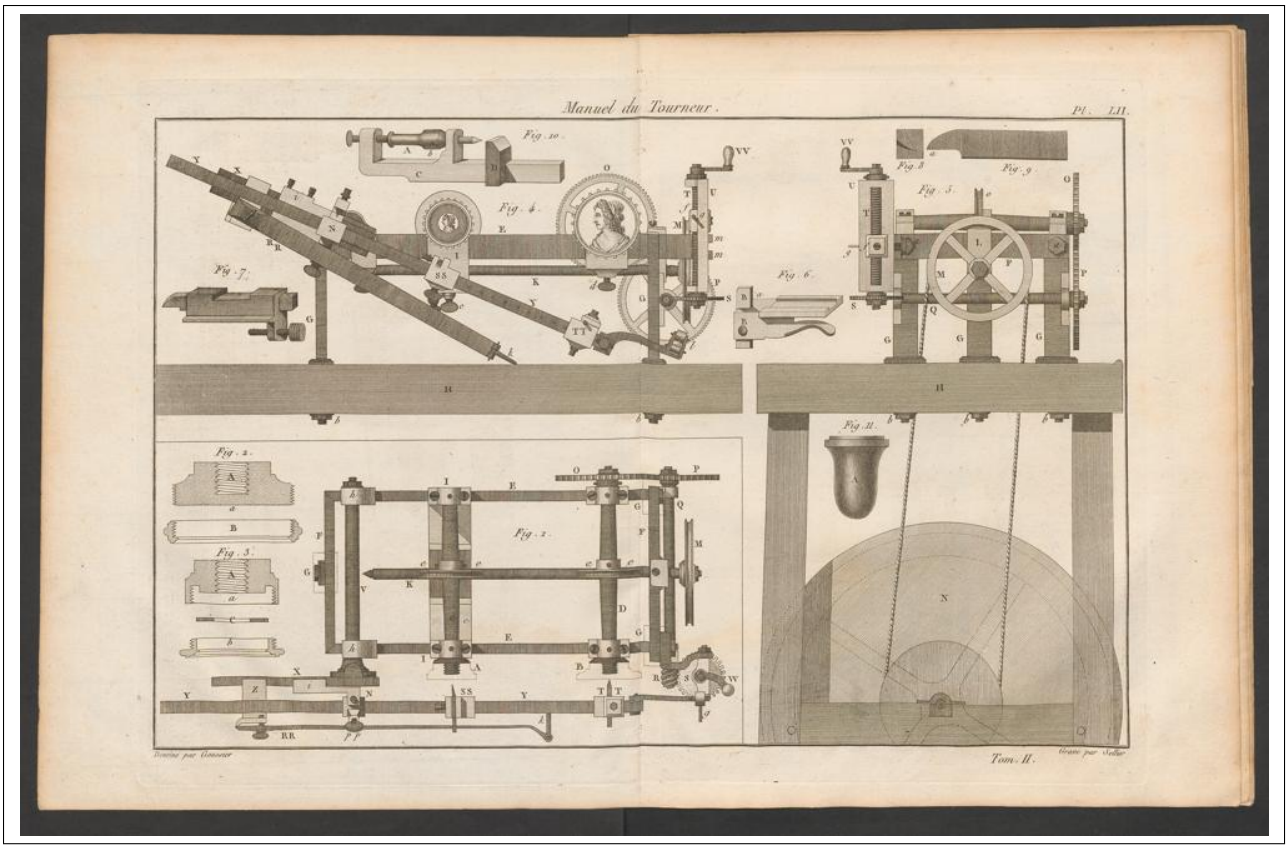
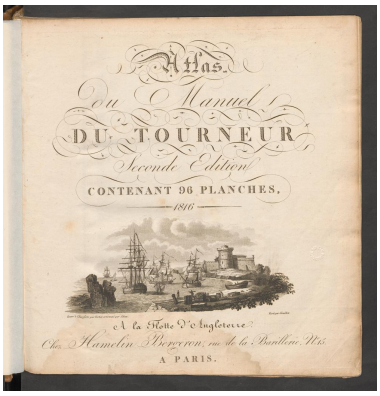


Plate 2. A Portrait Lathe (Bergeron, 1816)

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.)



Source: Bergeron, L.-E. and P. Hamelin-Bergeron. *Atlas ou Manual du Tourneur.* (Paris: Hamelin Bergeron, 1816): Plate LII.
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.
 Persistent identifier: http://dx.doi.org/10.3931/e-rara-9982

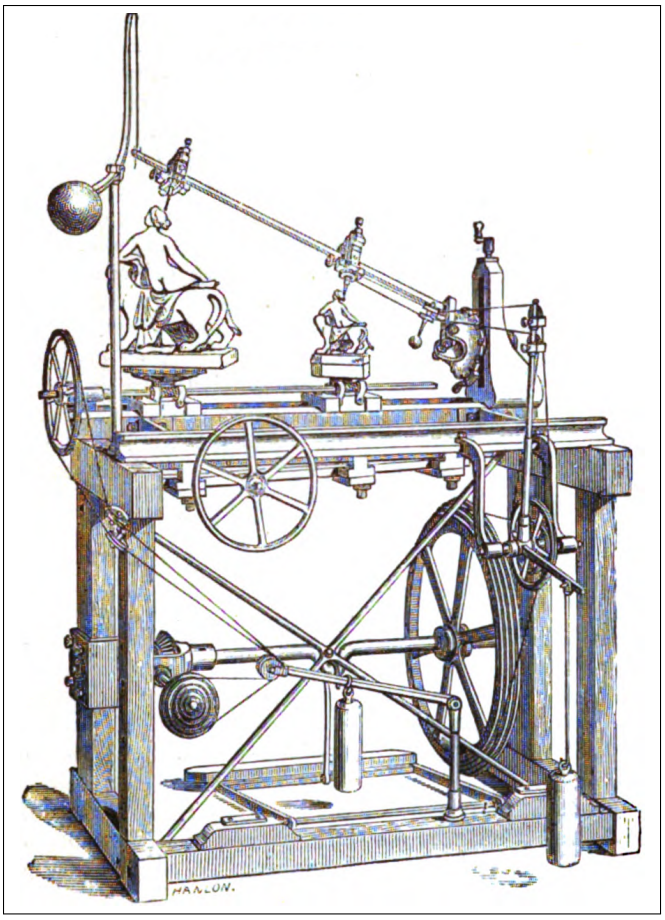


Plate 3. A 3-D Sculpturing Machine (Kennan, 1862)

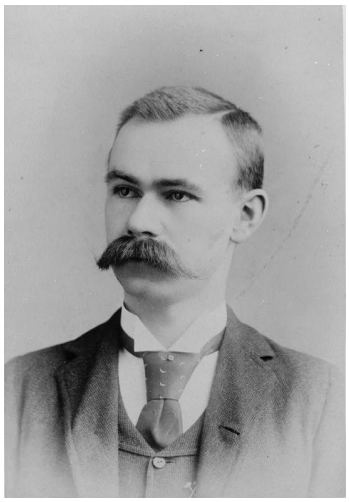
This is a mid-19th century single-arm pantograph implemented as a "machine for copying sculptures in ivory, wood, alabaster, etc., to any scale, either from relievos or rounds." Shown at the 1862 International Exhibition (London).

Source: Clark, D. K. *The Exhibited Machinery of 1862: A Cyclopædia of the Machinery Represented at the International Exhibition.* (London: Day & Son, 1862.): 228.

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
Photograph of Hollerith from the United States Census Bureau.
https://www.census.gov/history/www/sights_sounds/photos/1890_photos.php
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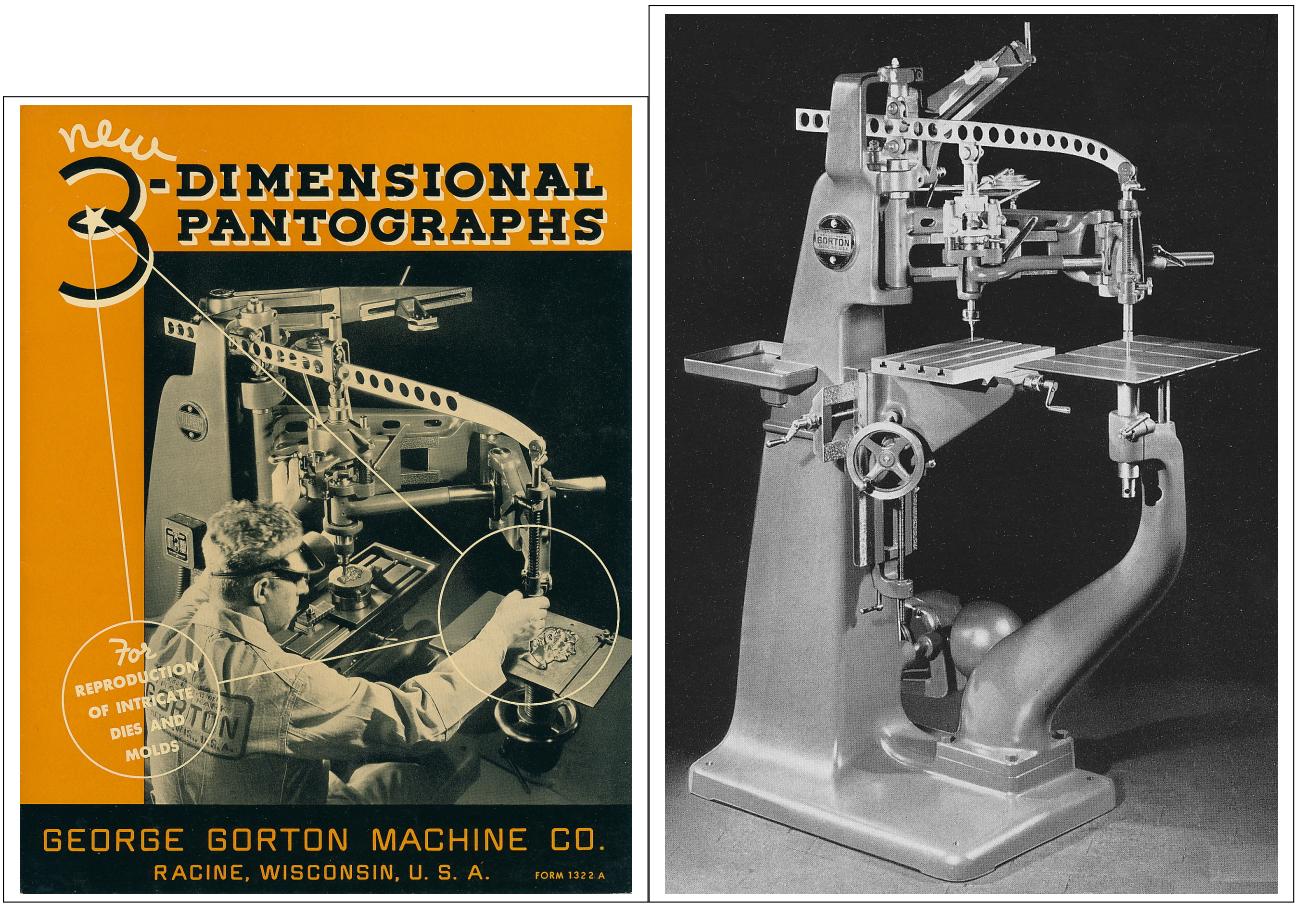
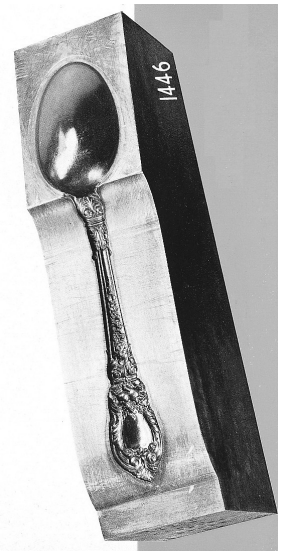


Plate 5. Gorton 3-D Industrial Pantographs (1937)

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.



Source: *New 3-Dimensional Pantographs.* Racine, WI: George Gorton Machine Co., 1937.
A scan of this manual by Joel Havens is online on the VintageMachinery.org site at:
`http://vintagemachinery.org/pubs/detail.aspx?id=17768`

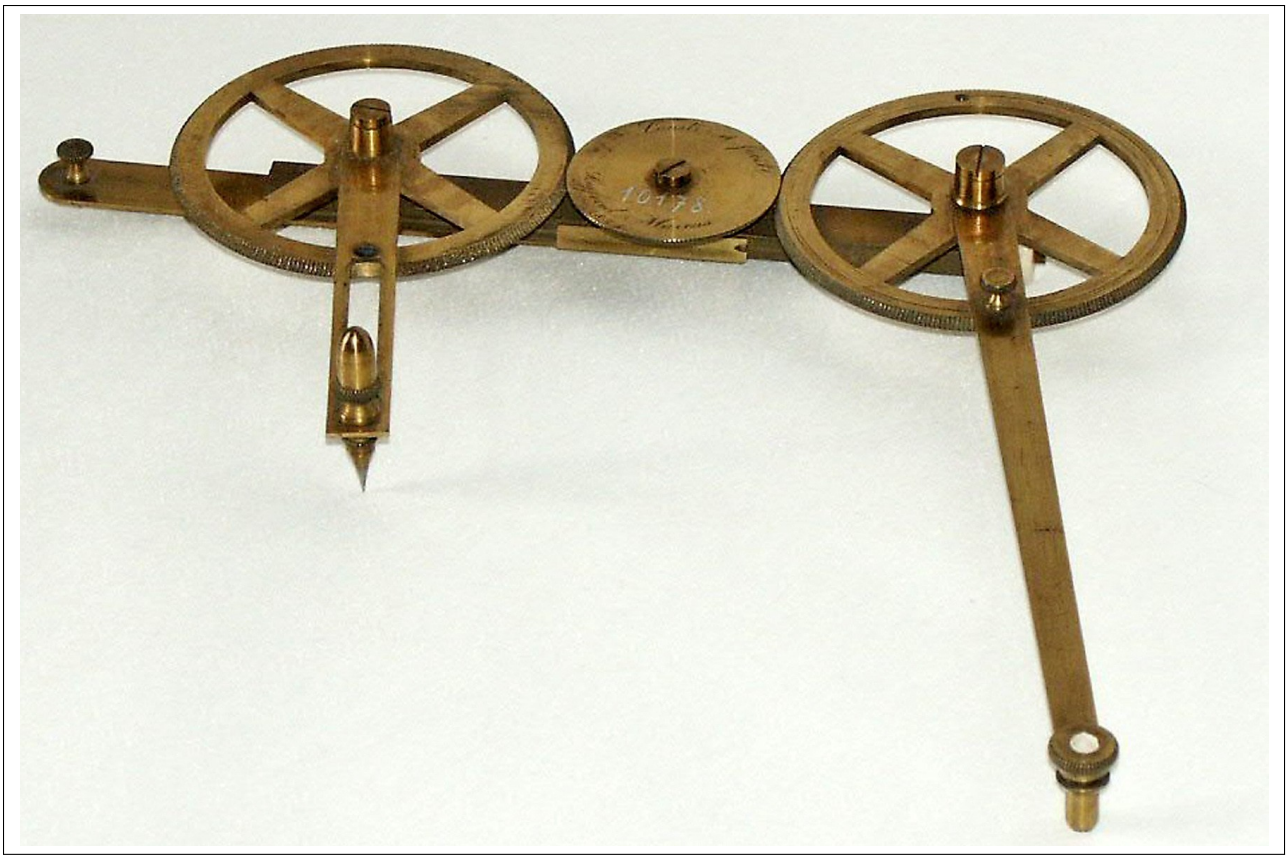


Plate 6. Marcus' Geared Pantograph (1855)

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.

Source: Photograph taken in 2007 by Audrius Meskauska and uploaded to Wikimedia Commons. Source: `https://commons.wikimedia.org/wiki/File:Schynige_Platte_diamond_pantograph.jpg`

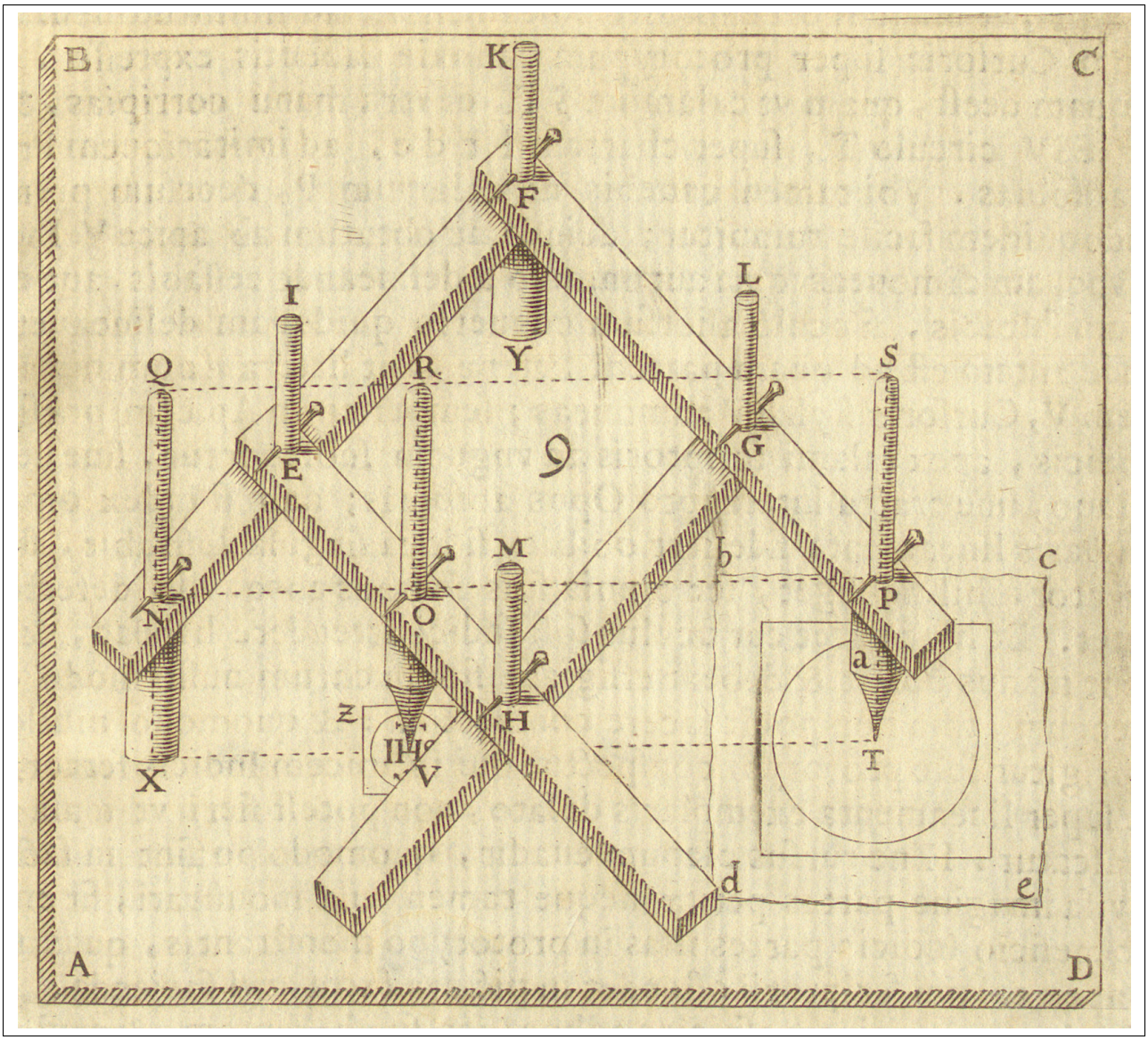
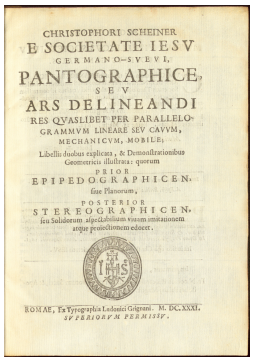


Plate 8. The First Pantograph, Shown in 1631

The four-bar pantograph invented by Christoph Scheiner, as shown by him in his *Pantographice seu Ars Delineandi Res...* of 1631, on p. 29.


CHRISTOPHORI SCHEINER
E SOCIETATE IESV
GERMANO-SVEVI,
PANTOGRAPHICE,
SEV
ARS DELINEANDI
RES QVASLIBET PER PARALLELO-
GRAMMVM LINEARE SEV CAVVM,
MECHANICVM, MOBILE,
Libellis duobus explicata, & Demonstrationibus
Geometricis illustrata: quorum
PRIOR
EPIPEDOGRAPHICEN,
sive Planorum,
POSTERIOR
STEREOGRAPHICEN,
seu Solidorum algebraicorum vasorum imitationem
atque proiectionem edocet.
IHS
ROMAE, Ex Typographia Ludouici Grignani. M. DC. XXXI.
SVPERIORVM PERMISSV.

Source: *Pantographice seu Ars Delineandi Res Quaslibet per Parallelogrammum Lineare seu Cavum, Mechanicum, Mobile.* Rome: Typographia Ludouici Grignani, 1631.
Digitized by the Getty Research Institute from their copy and presented at The Internet Archive. Public domain.
books.google.com/books?id=Bw5BAAAAcAAJ

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.

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. ЭРТх-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.

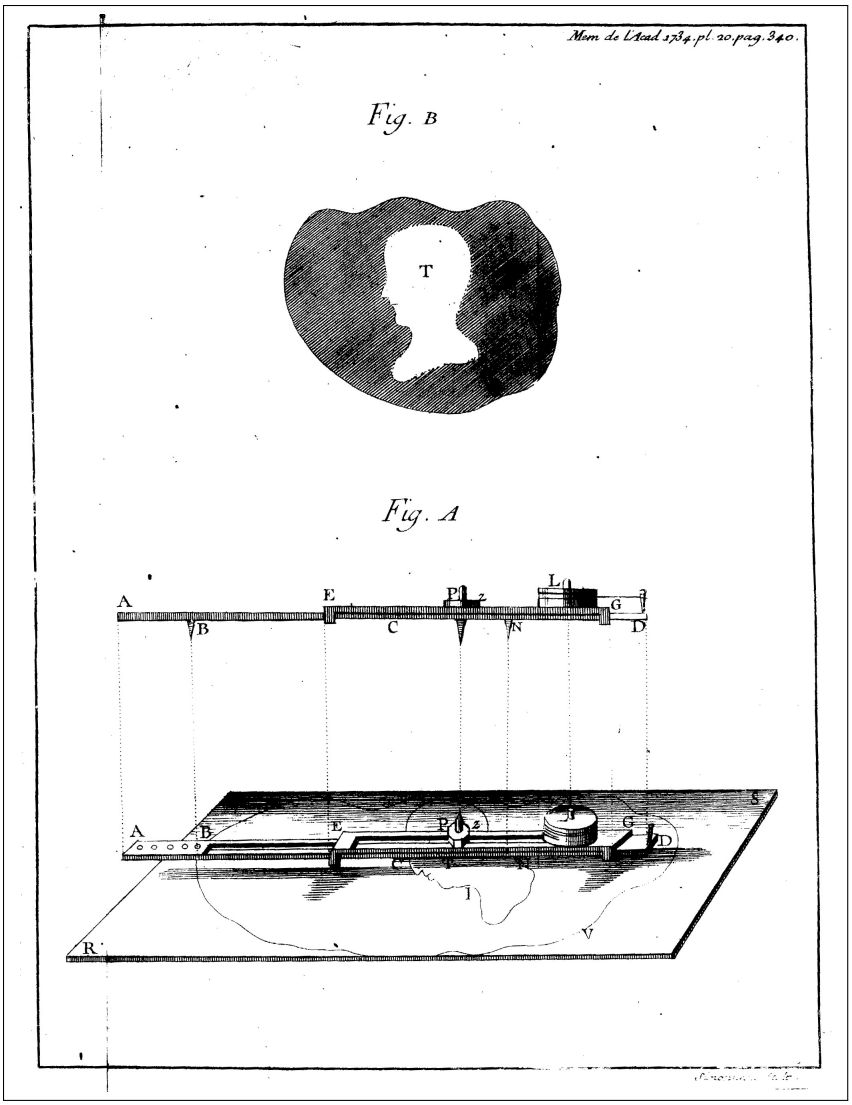
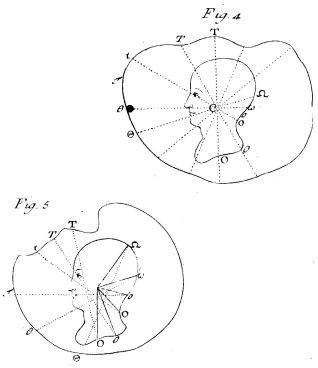


Plate 11. Condamine's Rosette Generator (1734)

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 ormanental turning lathe known as a "rose engine." This rosette would then allow the lathe to produce the original figure.



Source: Condamine, Charles Marie de la "Recherches sur le Tour," [part 2] "Examen de la nature des Courbes qui peuvent se tracer par les mouvements du Tour." *Histoire de l'Académie Royale des Sciences* [for year 1734] (Paris: l'Imprimerie Royale, 1736): 216–258 with accompanying Plates.
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