

# Methods of Stamp Printing

## Intaglio



# Engraving

## Copper & Steel engraving

- The picture is cut into the surface, the incised lines forming the image
- Usually printed Intaglio

## Wood Engraving

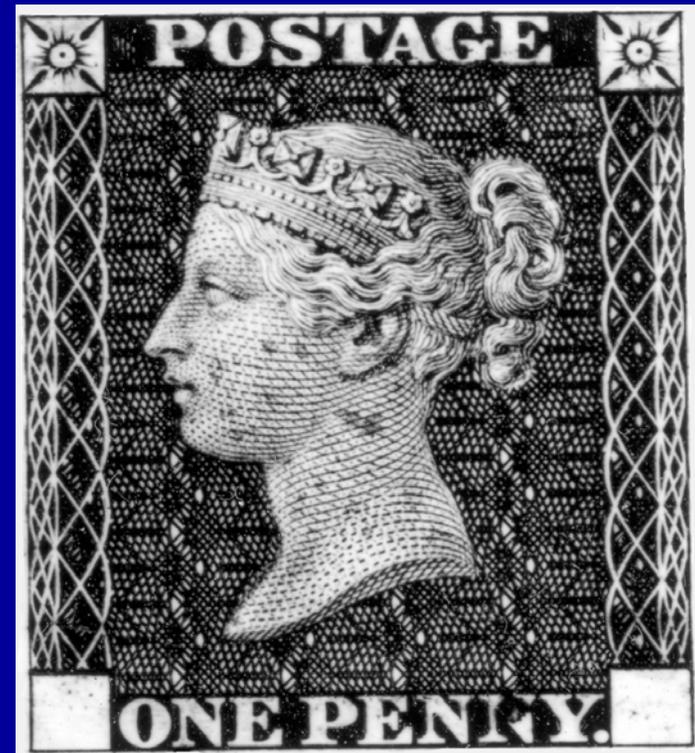
- Wood is cut away leaving the picture in relief
- Invariably printed letterpress
- Steel Letterpress dies produced in the same way

# The First Postage Stamps



Die

Courtesy BPMA



Die cropped and transposed

# Intaglio Printing

- The image to be printed is engraved into the surface of the printing plate
- Ink is forced into the engraved lines
- The surface of the plate is wiped clean of ink
- Paper is placed on the plate, covered by a felt blanket, and passed through a rolling press where the paper is forced into the recesses taking up the ink
- Today the printing forme is a cylinder and the process is fully automatic
- In this category are printing formes produced by Engraving, Etching and Gravure



A Perkins Bacon Press

Courtesy British Library

# Perkins Method of Plate Making

## Die and Mill Process



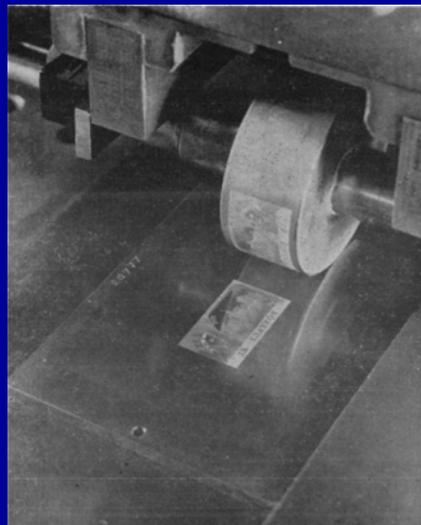
Die



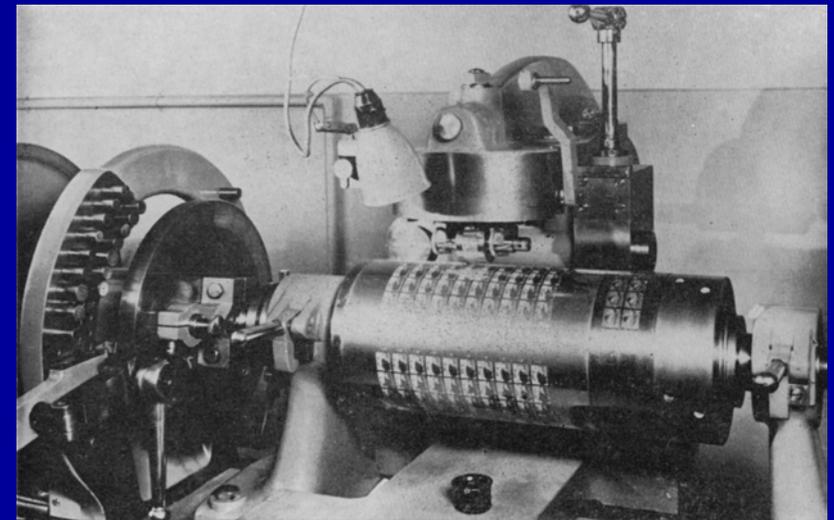
Transfer roller

Perkins Bacon 1879 tender.  
Letterpress printing.

RPSL Museum

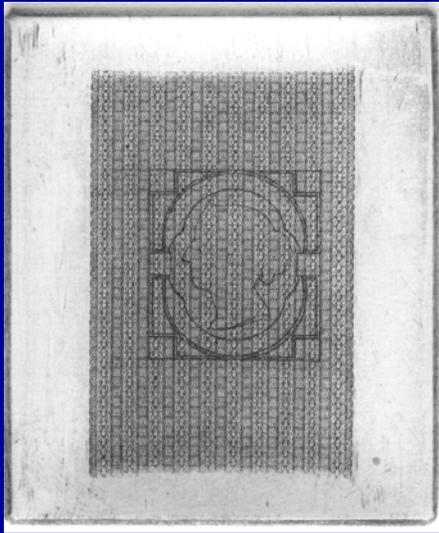


Picking up the image from the die onto  
the transfer roller and rolling the images  
onto the intaglio printing cylinder

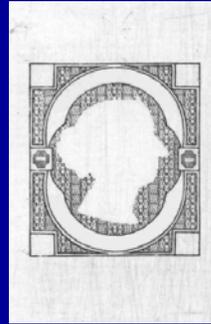


Transferring the design

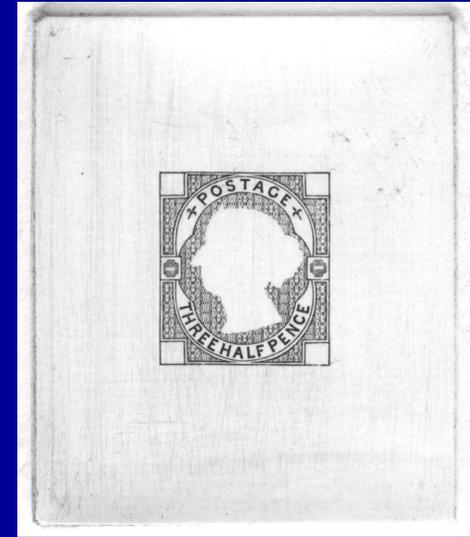
# Die Proofs



Primary die with background and outline of design



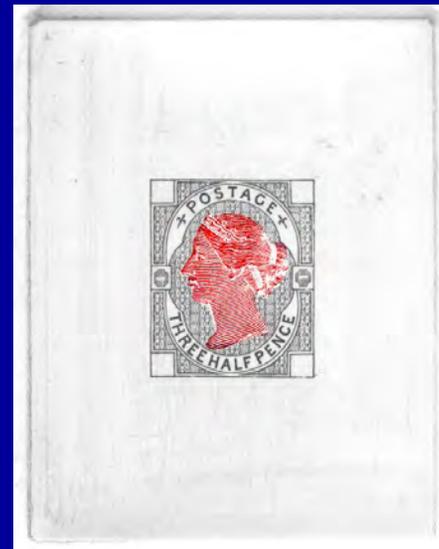
Simulated roller proof showing areas cleared for additional engraving.  
Printed letterpress.



Die proof with added detail



Scan of the head die for this stamp



Simulated inserted head

# Mill and Die Process

The Mill and Die process was invented by Jacob Perkins.

Below are illustrated dies and a transfer roller, in the RPSL Museum.

These were made as part of Perkins Bacon's submission for the 1879 tender for British stamps. They are for use in the preparation of letterpress printing plates, not intaglio plates



Completed die



Head transfer roller



Head die



Transfer roller with image taken from completed die

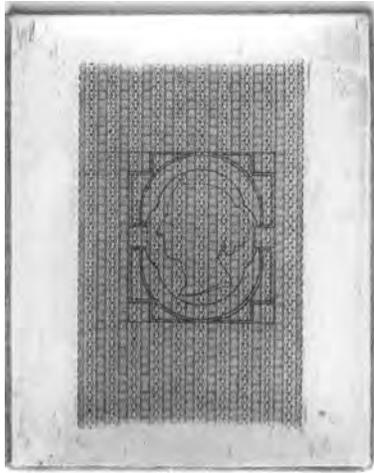


Die proof.

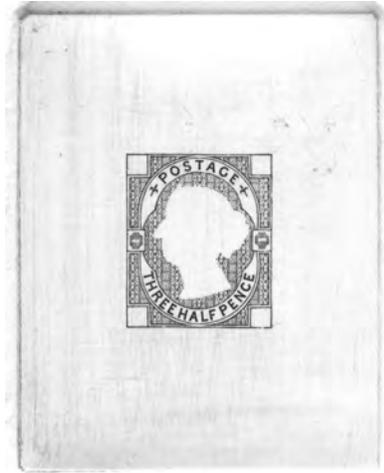
Courtesy British Postal Museum

# The Perkins Bacon Method of Die Production – 1

Die production went through several stages of intermediate dies. Each die was initially softened so that it would be easy to engrave and take an impression from a transfer roller. One of Perkins stock background patterns is rolled onto a blank die. The outline of the stamp and particularly the boundaries of areas that are to either print white or have additional engraving done on them are lightly engraved. This can be seen on die proof 1.



Die Proof 1



Die Proof 2

This die is then hardened and an impression taken on a transfer roller. The background pattern outside the stamp area is removed from the roller together with regions inside the image outline which are to print white or have additional engraving such as the queen's head. The roller is then hardened. The image on it is then transferred to a soft blank die. The blank areas are then engraved. Die proof 2 shows the second state die created from the transfer roller with the addition of **POSTAGE** and **THREE HALF PENCE**. The queen's head would be subsequently rolled in from a roller containing just the head.



An example of a *head* transfer roller.  
(With background to the head)



A simulated roller proof *printed intaglio*. The white areas are raised above the surrounding area of the roller and the parts of the image printed black.



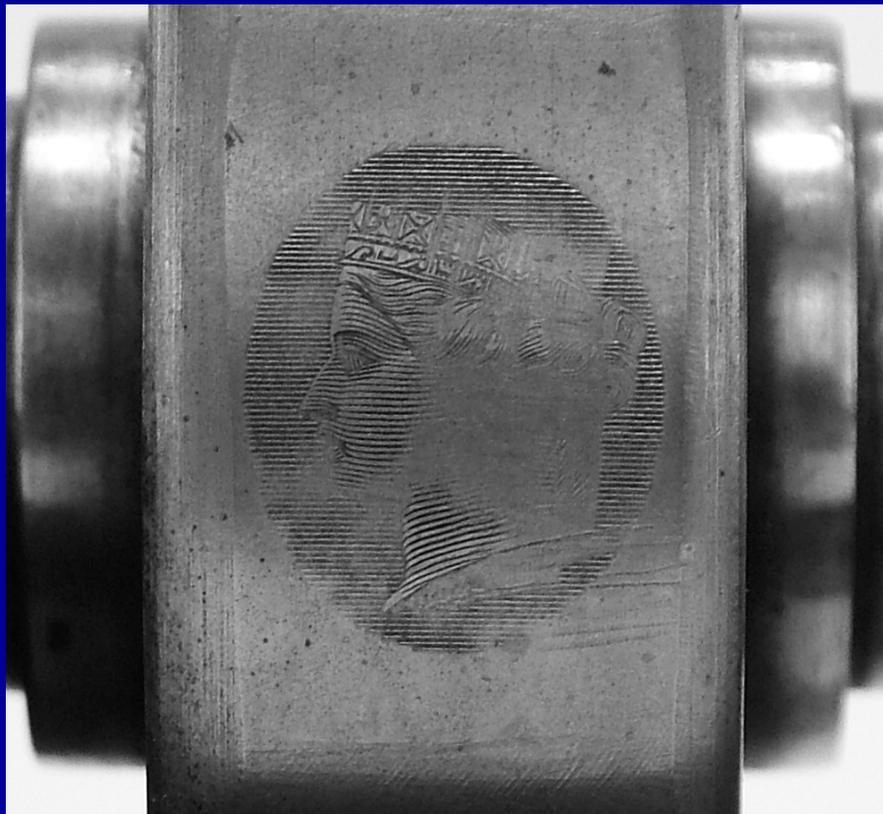
A photograph of the Head Die used with this frame.

The die proofs are modern prints taken from dies in the Royal Philatelic Society's museum.

Printed by Michael Griffiths of Badger Press.

# Making Corrections to the Die

- Die to be corrected is hardened and a transfer made to a soft roller
- Area to be changed is scraped from the roller
- Roller is hardened and a transfer made to a soft die



Area to be corrected scraped off



New roller for more corrections

# St Vincent 5s Die Stages

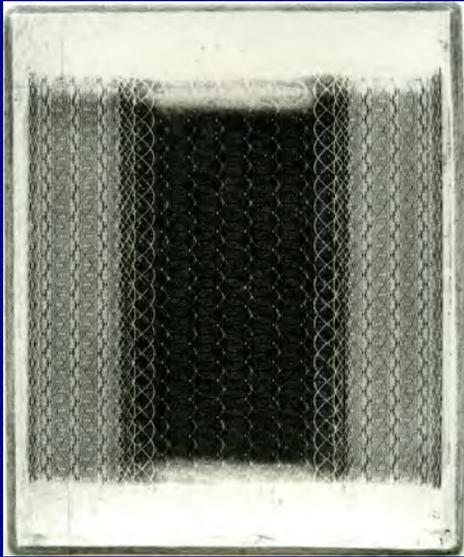


Fig. 1 Primary die with detail

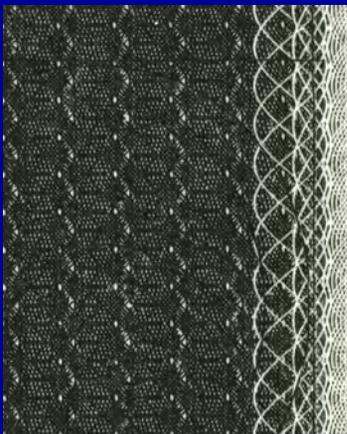


Fig. 2 Intermediate state

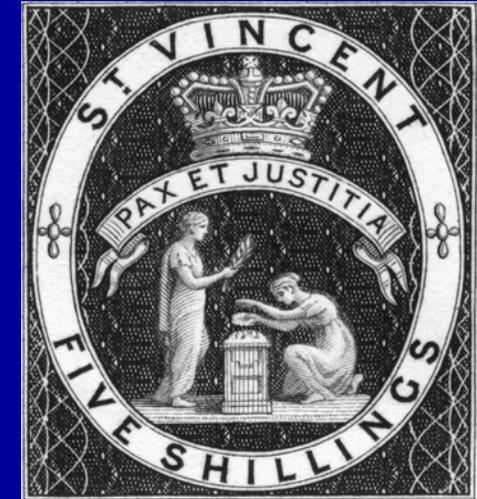
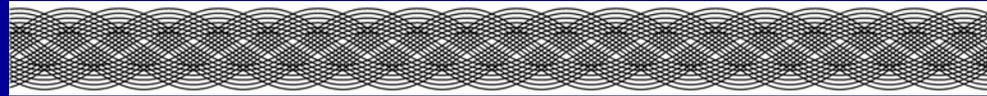


Fig. 3 Final die

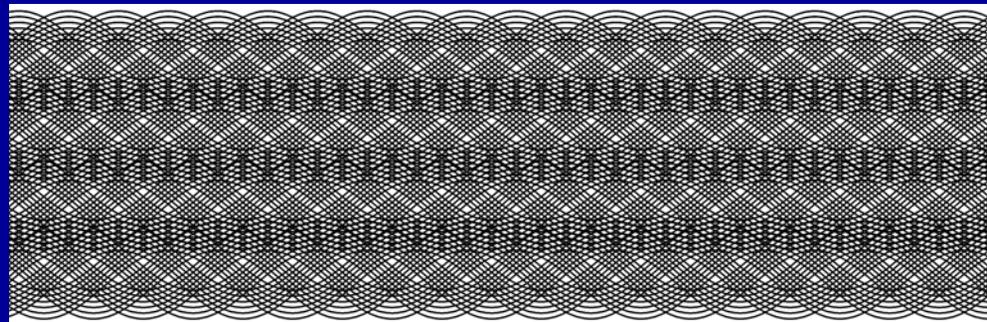


# The Penny Black Background

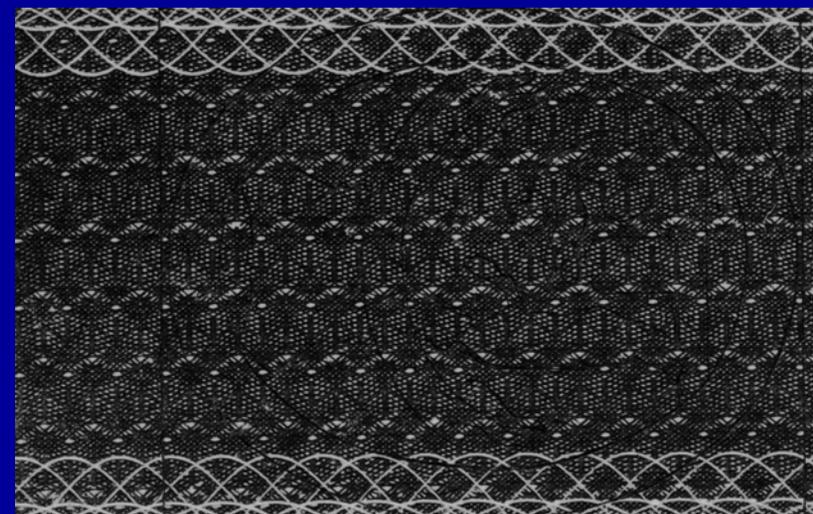


Basic Pattern

$$W = a \sin(\theta + \phi) + d$$



Compounded Pattern

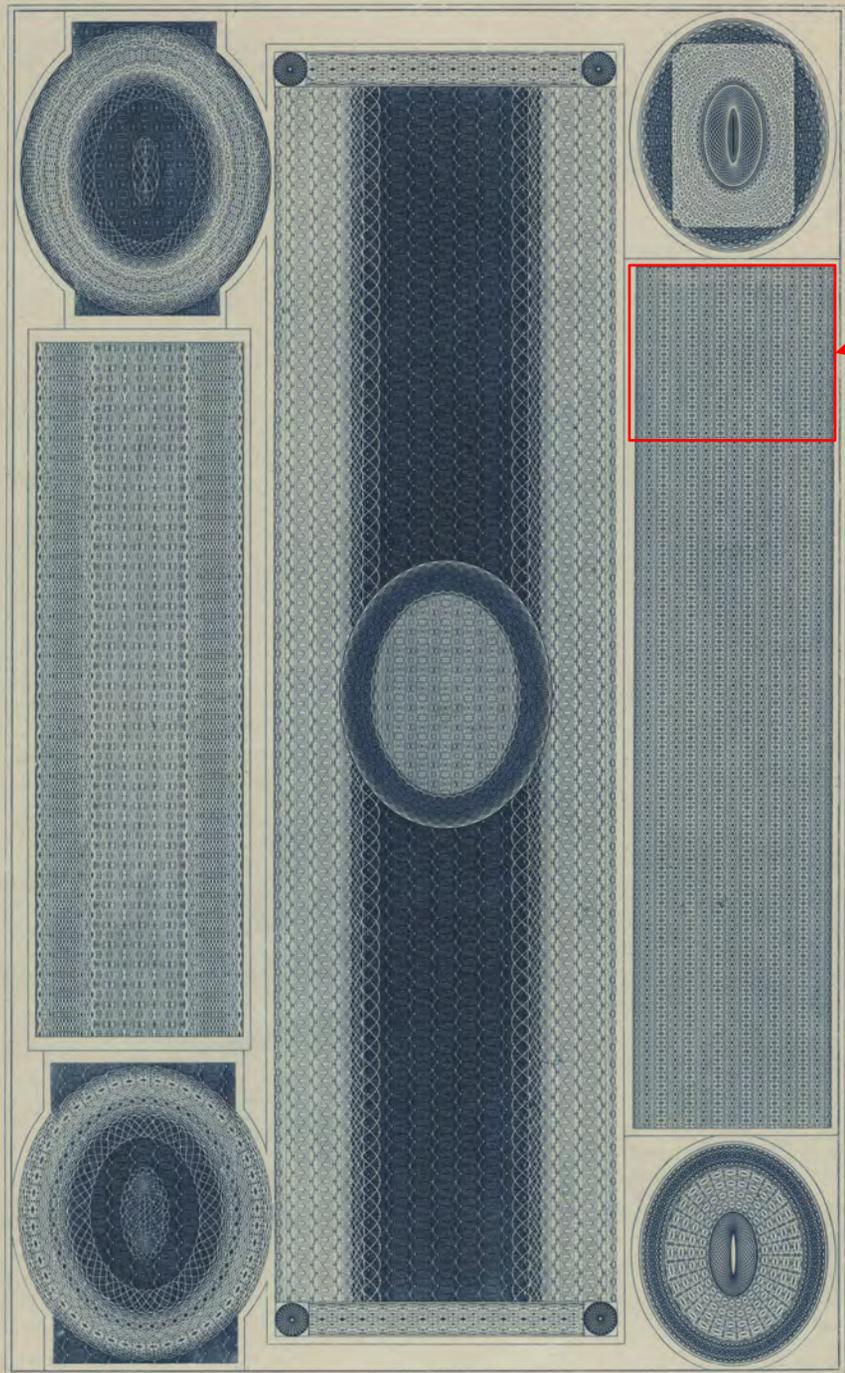


White line engraved on roller

Black line engraved on die

Penny Black & St Vincent Background

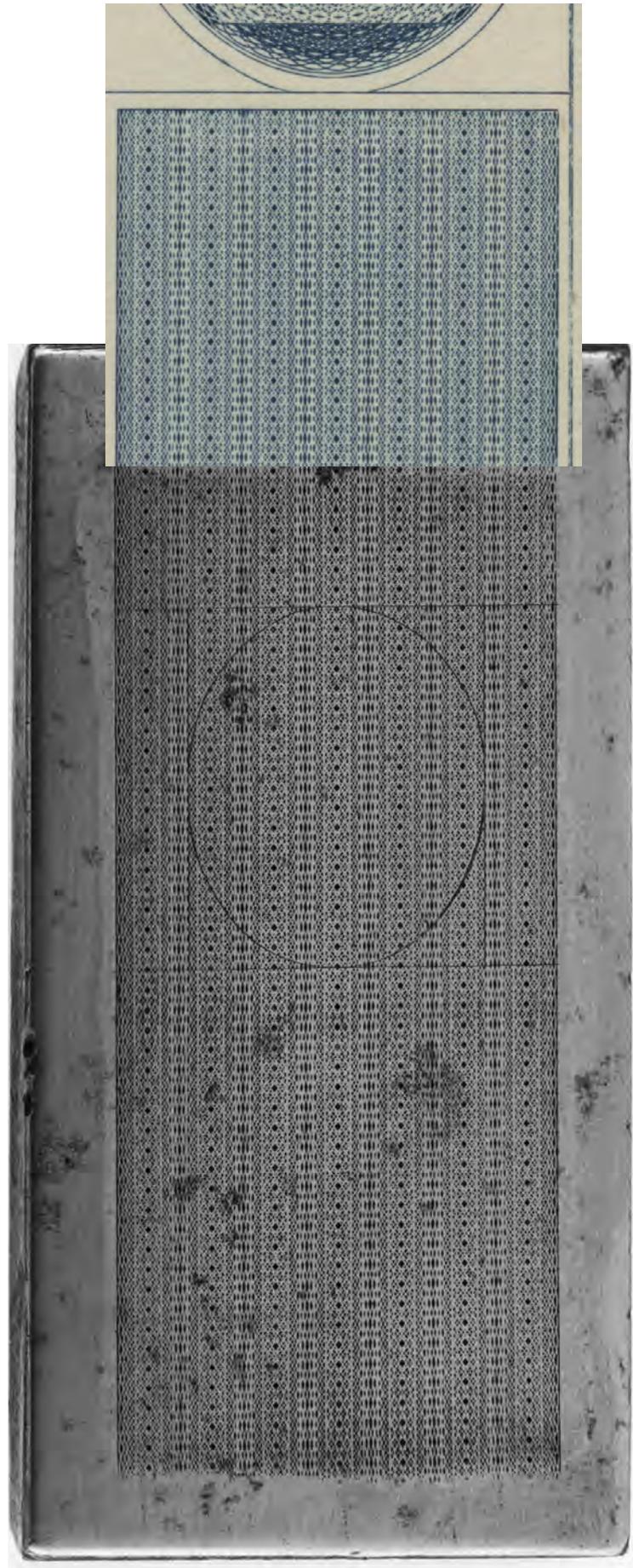
# Perkins Bacon Master Backgrounds



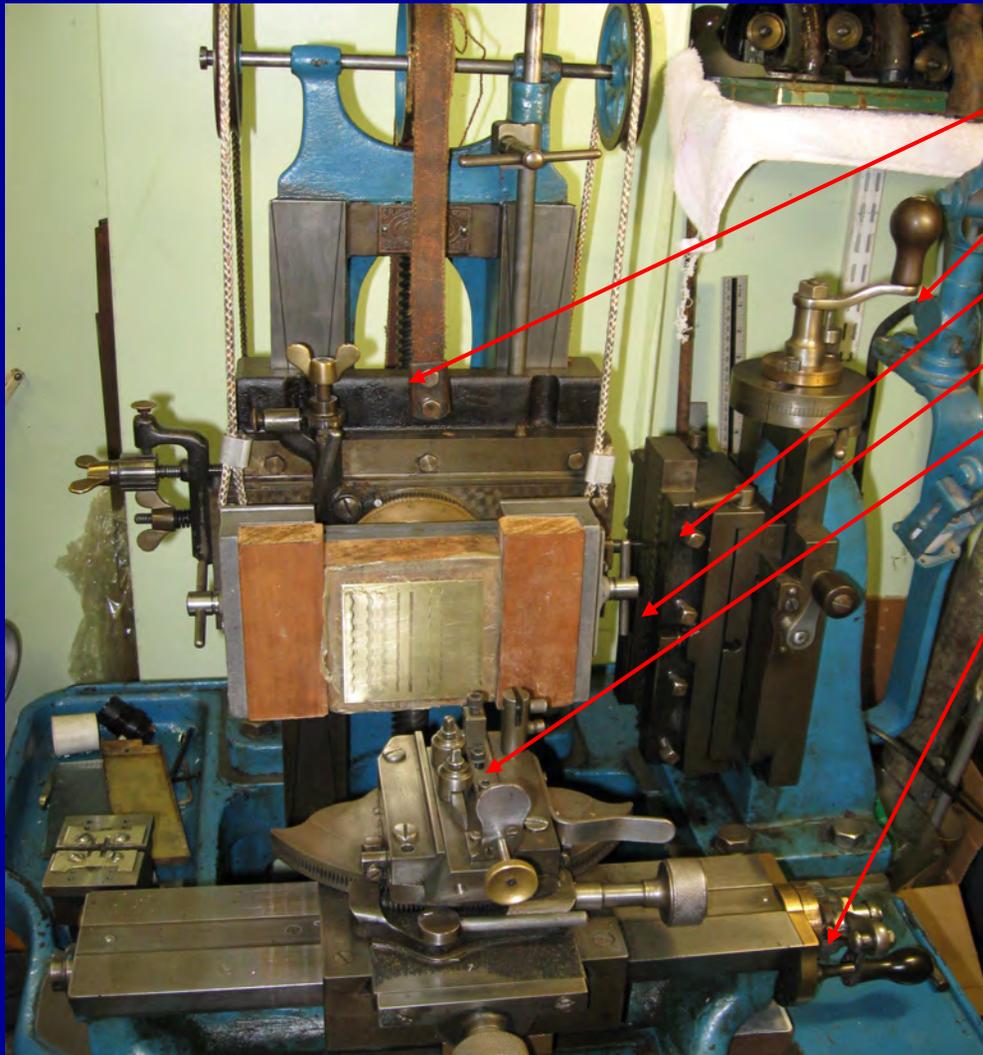
Reprint from the original plate

# A Die of the Background for a New Stamp

The pattern on this die was picked up by transfer roller from the master plate (blue segment). The roller was then hardened and the image transferred to this die. The die also has the outline of a new stamp. After hardening the die the area of the stamp would have been taken up on a soft transfer roller. At this stage the design is raised above the general background of the roller. The area not to have the background would be scraped off the roller, and the roller hardened and its image transferred to a soft blank die. Further detail of the stamp would be engraved on this die.



# Straight-line Engine (~1940-50)



- Mechanism for moving work-piece vertically
- Pattern bar offset control
- Pattern bar
- Rubber engaged with pattern bar
- Engraving tool
- Mechanism for offsetting the graver horizontally

Turning the driving handle (not visible) moves the work-piece holder vertically. This is spring loaded to keep the rubber engaged with the pattern bar. As the rubber passes over the pattern the tool engraves a pattern on the work-piece matching the shape of the pattern bar edge.

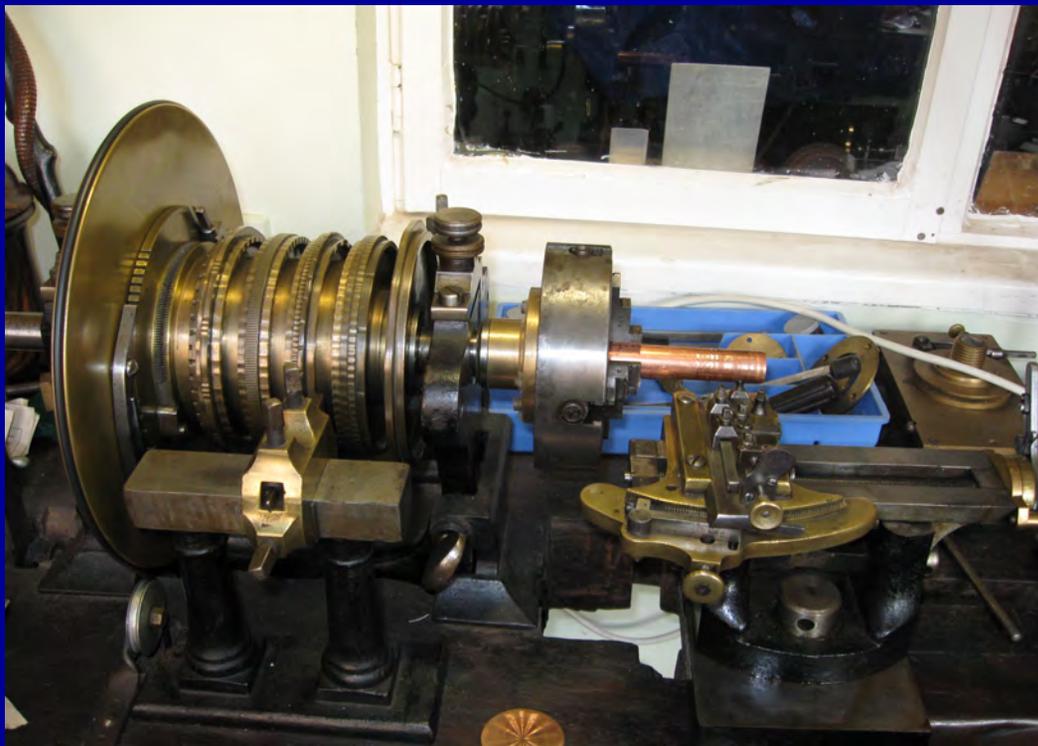
# White line Engraving



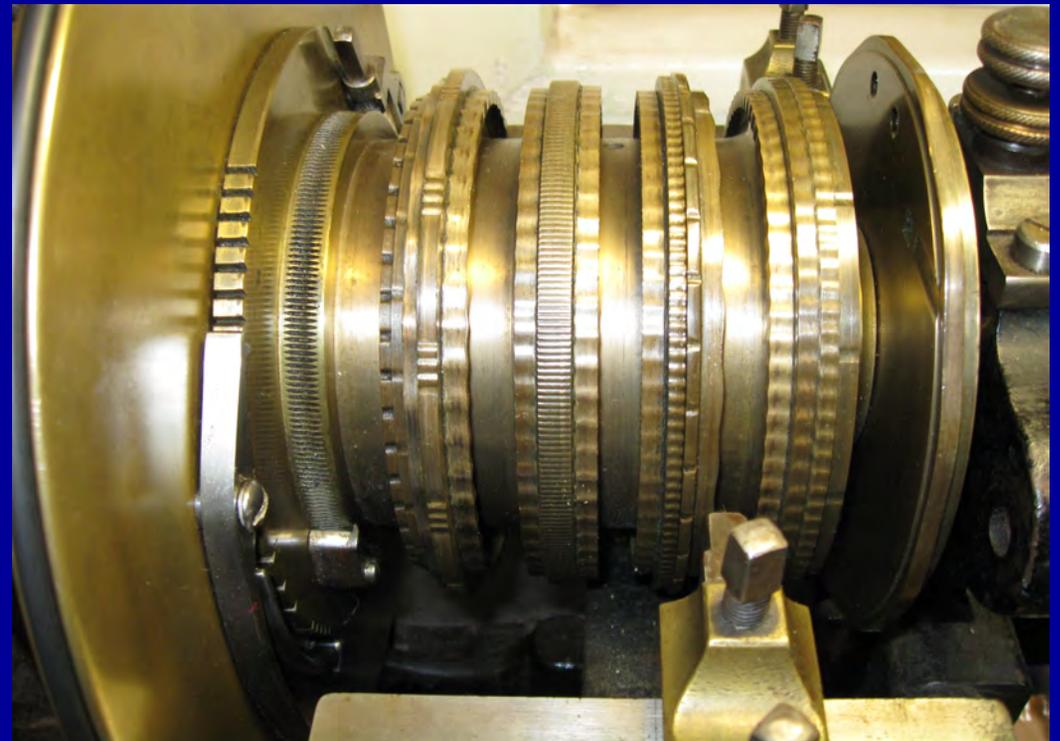
White line engraving done by engraving  
directly onto soft transfer roller

# Rose Engine (~1840-50)

Set to demonstrate how a sinusoidal line could be engraved on a transfer roller to produce a white line on the die.

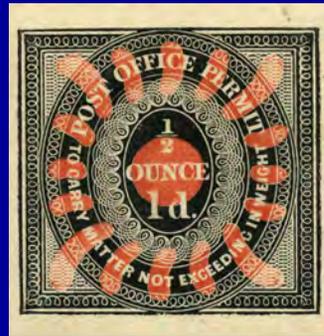


Rubber set for pumping mode

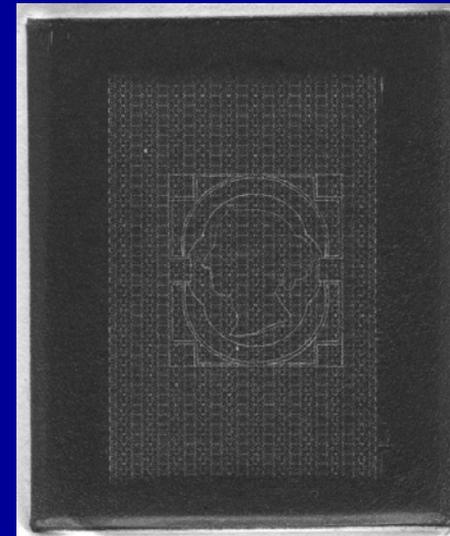


# Printing an Engraved Die

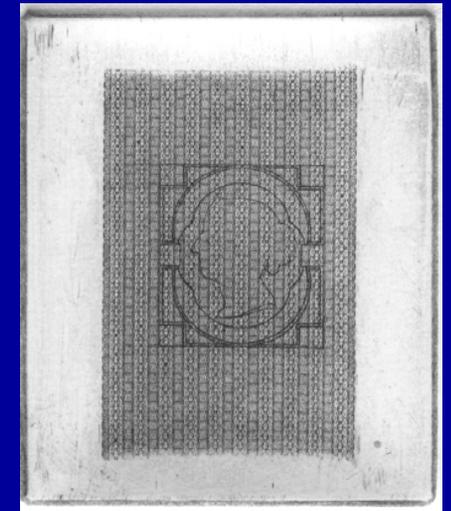
An engraving can be printed either  
*Letterpress* or *Intaglio*  
It depends on how it is inked



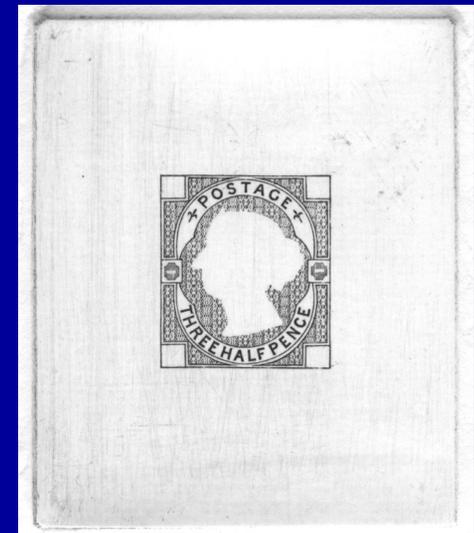
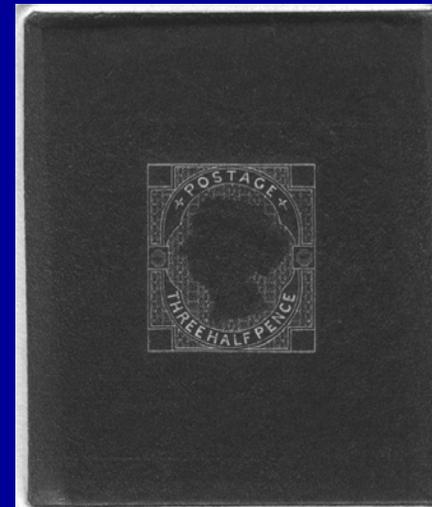
Both are engraved and both are printed Letterpress



Letterpress

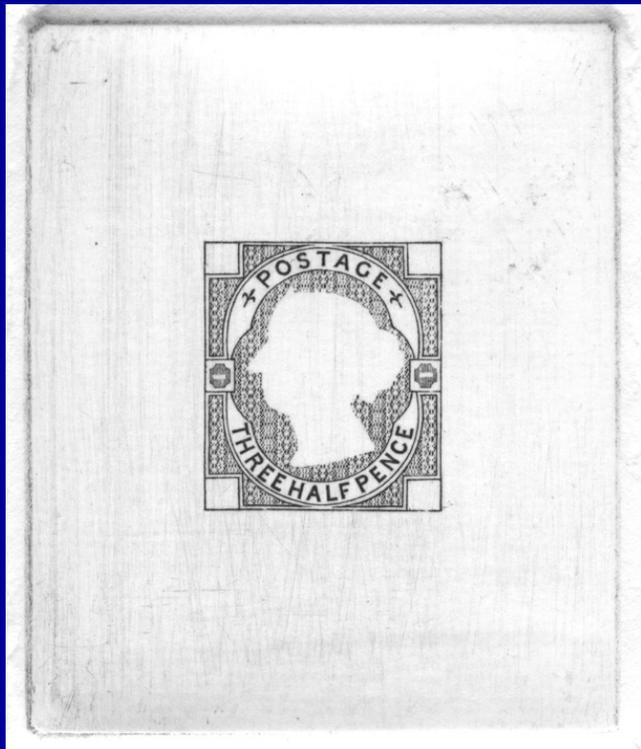


Intaglio



# Printing an Engraved Die

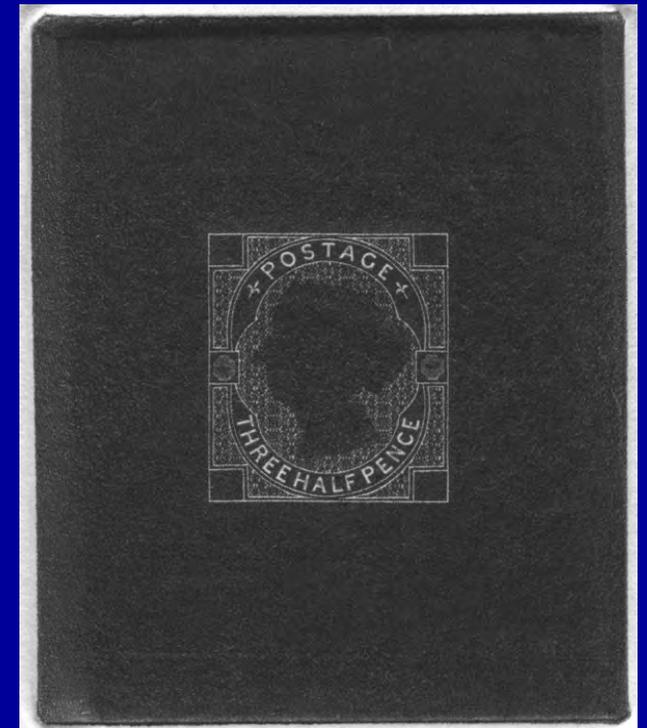
How a die prints is determined by how it is inked



Intaglio



Die



Letterpress

# Intaglio Printing – Engraving & Etching

Examples of the use of etching in stamp design and production.

An etched plate is printed intaglio by the same process used to print an engraved plate. It is therefore necessary to have the design recessed into the printing plate to enable ink to be taken up into the image.

In etching the plate is first coated with a uniform layer of an etch resistant substance such as wax. The design is drawn on the wax surface with an etching needle that removes the wax down to the metal surface. It is then etched into the plate surface. The etching liquid used depends upon the metal of the plate. Ferric chloride is typically used for copper with an acid etch for steel. The deeper the etching the darker and wider is the printed line. To limit the depth of etched areas, they are stopped by painting over with acid resist (wax), once they are deep enough, to prevent further etching.

German Composers' festival 1935.

Printed Intaglio.

The wigs and beard are etched.



New Zealand Health stamps 1945.

Printed Intaglio by Bradbury Wilkinson.

The foliage of the background is etched. The tree appears to have been engraved over the background, traces of which can be seen under the lower part of the trunk.



Germany, May - December 1921

The main design is printed Intaglio with the green underprinting lithographed.

The whole design is etched giving a much more free and fluid design. It is the only German stamp of this period that is etched and is surprisingly out of keeping with the design of its contemporaries.



# Time to View

