

The process that led to the 'grill' stamps of the United States

...from the first experiments in 1865 to the earliest Z-grills in January, 1868...

Purpose

This exhibit shows how the embossed (or 'grill') stamps of the USA were developed – from **Charles Steel's first experiments** in 1865, to the earliest known, **officially distributed Z-grill stamps**, in January 1868.

Scope

The story begins in 1865 when Steel wrote to the USPO to suggest an embossed stamp to prevent reuse. At the time, the National Bank Note Company produced the USA's postage stamps. Steel was its operations manager.

The exhibit records Steel's struggle to get his grill idea accepted; and shows how the NBNC attempted to sidestep Steel's patent with its own forms of punctured paper. The story ends in January 1868 when the 1861 2c and 3c became the earliest officially used Z-grills stamps.

The exhibit is complete. It shows examples of all of Steel's known experiments.*

Exhibit Plan

Chapter 1: First experiments – the flat square grills	2
Chapter 2: The earliest experiment for postal use – the A-grill	5
Chapter 3: The second experiment for postal use – the C-grill	7
Chapter 4: Steel's design for a surface-printed 'grill' stamp	10
Chapter 5: The NBNC's attempts to side-step Steel's patent	14
Chapter 6: Conclusion - the officially issued Z-grill	15

One set recorded

e: PF

Ex-Steel
Crawford
Brazer
Drews



C-grill essay: perf 12, un gummed
Points up Points down

Importance

Steel's idea for an embossed stamp, was the only private patent adopted by the USPO to prevent reuse. It is one of only two adopted worldwide. The first experimental stamps were issued in 1867. Official issues followed in 1868. 'Grill' production ended in 1873; but it led to some of the most sought-after stamps in USA philately.

Research

The exhibit has been built around personal research (highlighted in cyan) based on the [Brazer archive](#). The archive records the correspondence between Steel, the USPO and the NBNC. It enables a precisely dated analysis of the trial and error that led to the form of 'grill' that was eventually adopted.

Magnified scans show how the 'grill' evolved*

Late 1865

Flat square, points down
First experiments



Early 1867

Pyramid-shaped 'biscuit grill'
'A' and 'C' grill



Late 1867

Flattened pyramid
Steel's patent design



Early 1868

Horizontal 'rooftop' grill
'Z' grill



Exhibit highlights

Unique items are boxed in **blue**. Census numbers are noted in **bold blue** script. Highlights include:

- Steel's 'first experiments' of 1865 **2**
- The **earliest known postal use** of the experimental A-grill (August 13, 1867) **6**
- A full, unprinted but gummed sheet of the **experimental C-grill** (ex-Earl of Crawford) **7**
- The **signed essay** of late 1867 which acknowledges **Steel as the inventor** of the grill **10**
- The die produced by the NBNC to test **Steel's design** for a **surface-printed grill** **11**
- The NBNC's 'scratch pattern' alternatives to Steel's grill (ex-Earl of Crawford) **14**

* See: **Hofmeyr, J.H.** (2018), 'Archival History of the Embossed Stamps of 1867-68,' [The Chronicle](#), 70:4.

Steel's 'grill' concept

Charles Steel's idea to create a stamp that could not be cleaned and reused, was for a stamp whose fibres had been broken by embossing. When cancelled, the ink was supposed to seep into the broken fibres and integrate into the paper. The name 'grill' comes from the shape of the embossing.

1865: Steel's first experiment: created using the NBNC's machinery

Two recorded



Ex-Finkelburg

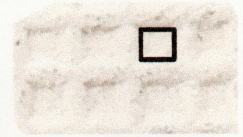
On wove paper. Circles 11mm or 12mm

In a letter dated December 20 1865, Zevly acknowledged receipt of Steel's samples: "Sir... acknowledging the receipt of the samples of stamps submitted by you, with which I am favorably impressed. (But) **no judgement can be formed...** until they have passed certain tests."

1865-67: The earliest experiments are indented squares with a flat square bottom

On white wove paper: un gummed

Magnified scan of the earliest grill



One recorded



Ex-
Brazer
Finkelburg
Drews

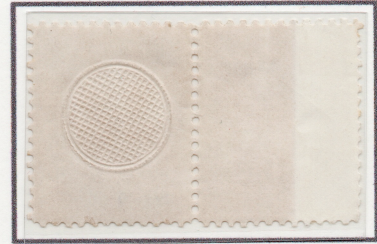
Imperf
*Embossed circle surrounded
by perforations*

Two recorded



Ex-
Finkelburg
Lake Shore

Imperf
*Red '3' in circle tests
printing on a grill surface*



Perf 12
Plain circle

Tests of cancellations – to see if the embossed area absorbed the ink

Imperf
Gummed



*Tests a pen
and ink cancel*

The only recorded pair e: PF



Perf 12
Ungummed

Cancelled: NY
segmented diamond
(mid- 1867)

An experiment using a plate of the 1861 3c stamp

Imperf, gummed



1865-67: Tests of Engraved and Surface printing on **flat raised squares**

Engraved printing on raised squares: some with pen and ink cancellation tests

1. Plate proofs: imperf, gummed



Rose



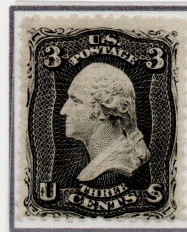
Ink cancel test 'No 2'

2. Stamps: perf 12, gummed

Rose
Imprint
block



Black



Surface printing on raised squares: using a typographic adaptation of the 1861 stamp

Carmine
Imperf, gummed



Annotated left corner strip of five

Research note:

In his patent 70,147, registered in **October 22nd 1867**, Steel had argued that grill stamps should be **surface printed** because he was worried about the quality of engraved printing on embossed paper.

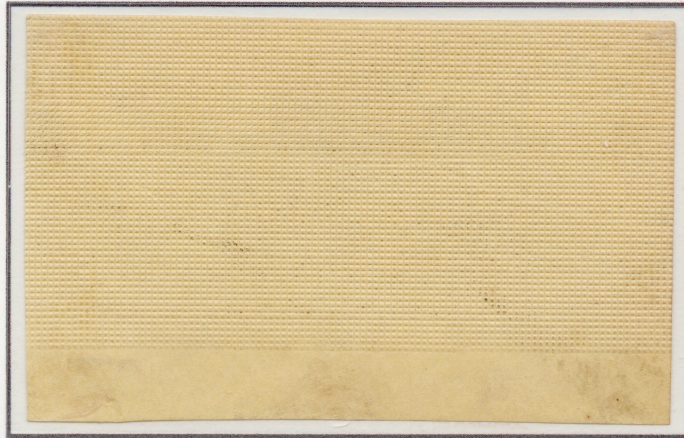
The corner block above is a test of **surface printing** on the **raised flat square grill**.

Based on the archive, the test dates to about **November 16, 1867** when **Maun** of the NBNC sent **Zevely** surface printed samples: "... I have the pleasure to enclose... No. 3 **surface printed**... and gummed"

In his **original response** to Steel in 1865, Zevely had written: *“The best test would be... (to) manufacture a number of these stamps to be sent out, sold, and used...”* The first **postal tests** used the **A-grill**.

The Pyramid shaped A-grill

Essays produced by
Steel at the NBNC
On tinted papers
Imperf and ungummed



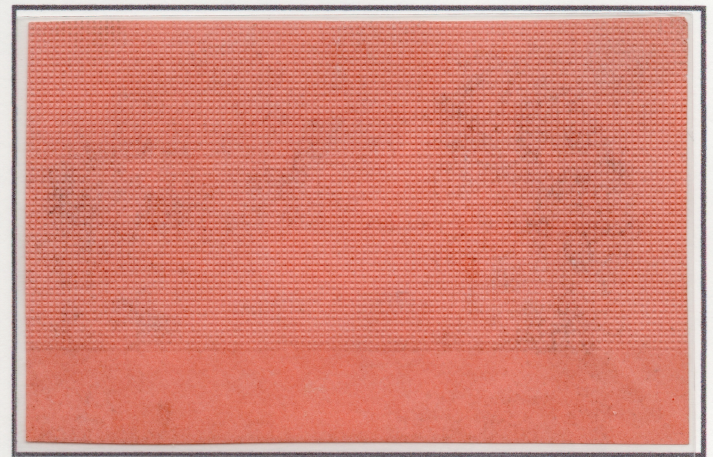
Light yellow



Scan of the
pyramid grill



Light gray green



Salmon

An A-grill test of **surface printing** and **pen and ink** cancellation: imperf and ungummed

47 x 24 mm grill area
White wove



Ex-Drews

This **important essay** tests both **surface printing** on an embossed paper and **pen and ink** cancellation

On **July 26 1867**, Zevly wrote to Shepard (Pres. NBNC), suggesting that the NBNC produce **10,000 sheets** of the A-grill for postal testing

*“After due inspection... I am free to say that the embossed stamps are **more desirable** than any heretofore submitted... I suggest that 10,000 sheets of the 3-cent be printed...”*

A-grill plate proofs: bright rose. Imprint and plate blocks, imperf, gummed, points up



On **August 13, 1867** the first experimental A-grill stamps went through the post

3c pays the ½ oz domestic letter rate

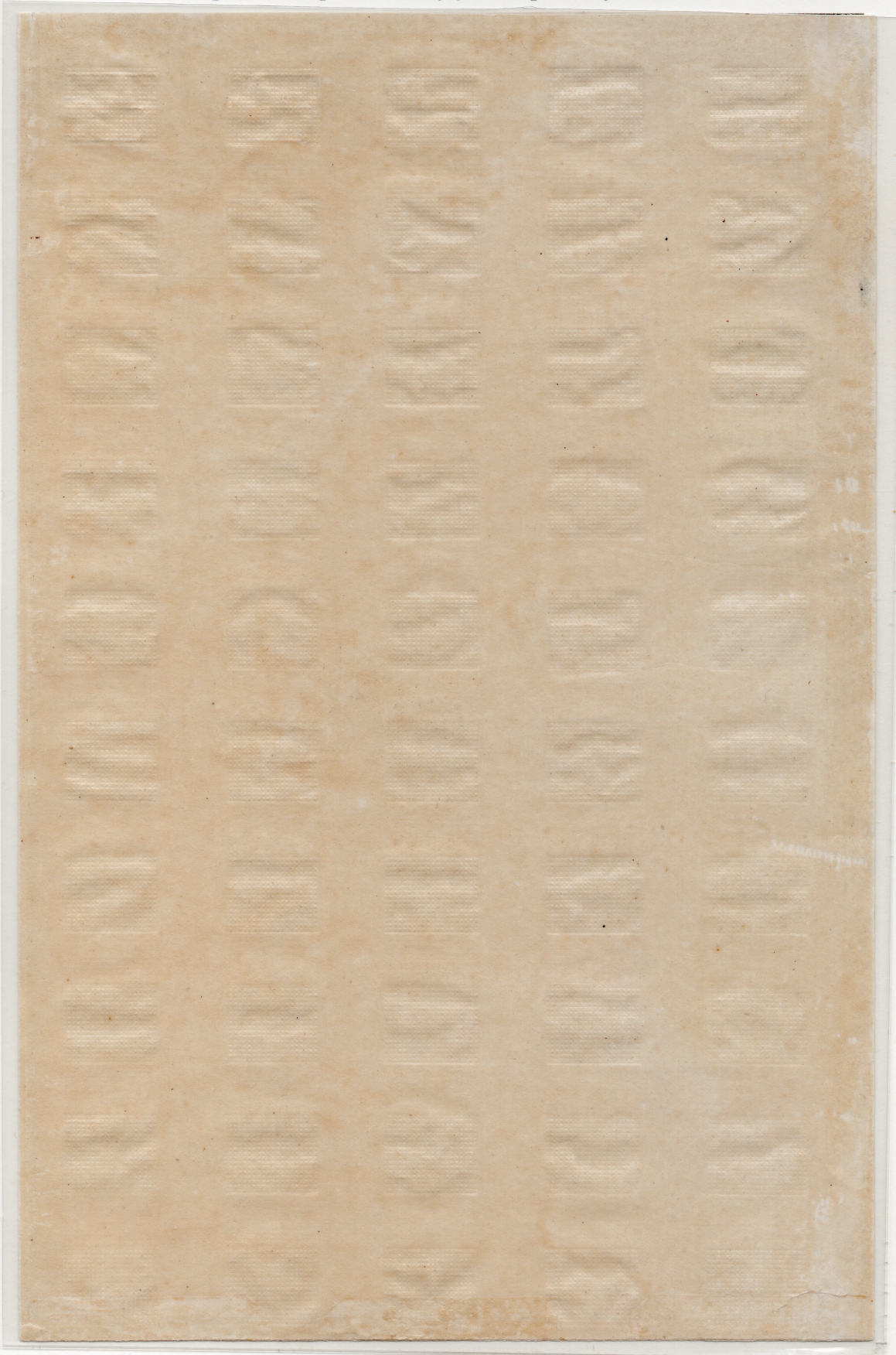
EKU

Four covers recorded



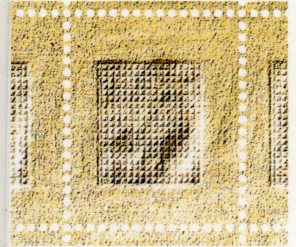
On **October 7 1867**, Zevely rejected the A-grill

*“The stamps with entire surface embossed **will not meet** the wants of the Department. I am awaiting the specimens promised by you, especially those with the **embossed centre.**”*



C-grill: 13 x 16mm,
points up

A complete pane: folded
and turned sideways



*A scan shows how the
grill would be centered in
a stamp (22 x 27mm)*

Only remaining pane

**Ex-Earl of Crawford
Drews**

This sheet was part of a
complete sheet of two.

The Philatelic
Foundation retains the
second, but cut it into
squares for research.

On **October 16 1867**, Zevely ordered one million C-grill stamps

The experimental C-grill stamp

Plate proof

Imperf, gummed, points up



The issued stamp

Perf 12



'Bluebird' of Rockford fancy cancel

Grill variety



Double grill, one split

Pressure tests: on gummed blanks, perf 12. Three levels of pressure

1. No pressure



Pale pink wove

2. Some pressure



White wove

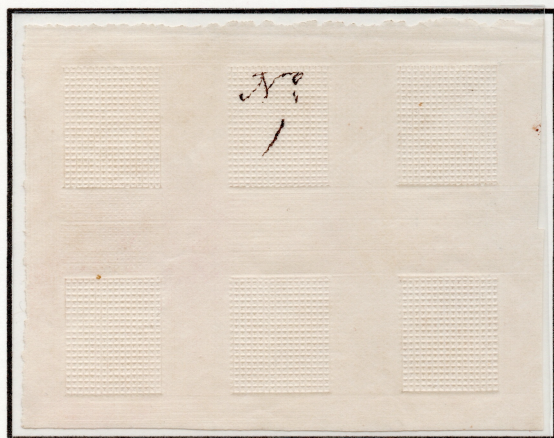
3. Sustained pressure

Two recorded



Approved:
By officers of the NBNC
Ex-Finkeleburg

Permeability tests: 'No 1' tests an unflattened grill; 'No 2' tests a flattened grill



Imperf, gummed



Research note: Steel was worried about printing on the 'grill'. He therefore argued that the grill should be **flattened** before printing. But this led him to worry about the **permeability** of flattened grills.

On **October 22 1867**, Zevely ordered the NBNC to produce a **surface printed** grill stamp

'C' grill experiments with a **surface printed** design derived from plates of the 1861 3c

i) **White wove, points up: gummed, perf 12**



Red



Yellow



Brown



Pink

ii) **White wove, points down: gummed, perf 12**



Black



Yellow



Blue



Red



Green



Yellow-orange

iii) **Gray-green chemical paper: gummed, perf 12**

Points down



Blue



Orange



Black

Points up



Green

iv) **Tinted papers, points down: gummed, imperf**



Black on Lilac-grey



Dark blue on White

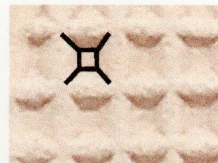


Blue on Pale blue

Also on **October 22 1867**, Steel's patent 70,147 for an embossed stamp was issued

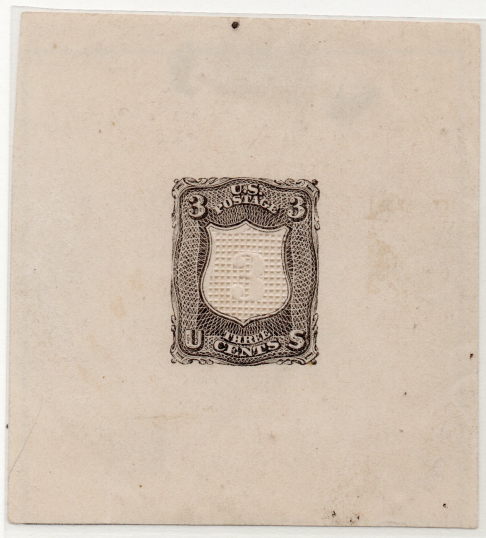


- Steel's idea (see reference below):
 - To use lithographic printing for the design
 - To leave the center portion blank for embossing
 - To use chemically sensitive or yellow, tinted paper



These essays mostly use a flattened pyramid

The essays on this page are the best representation of Steel's patent

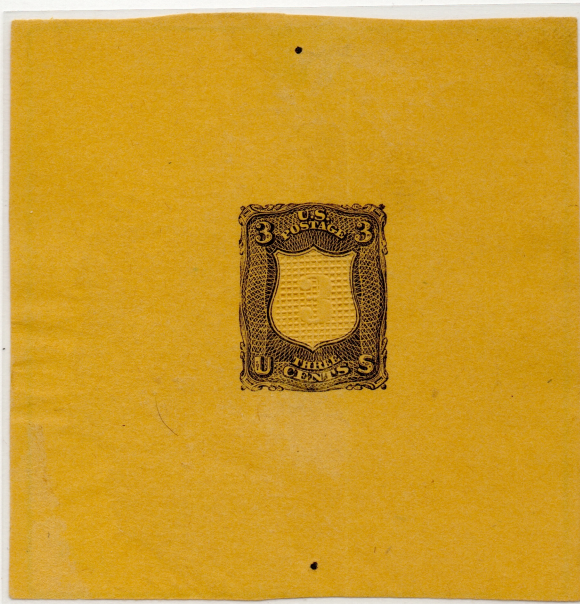


Black on white wove



Deep pink on white wove

Black on yellow-orange wove



Black on Yellow wove



Deep pink on Yellow-orange wove



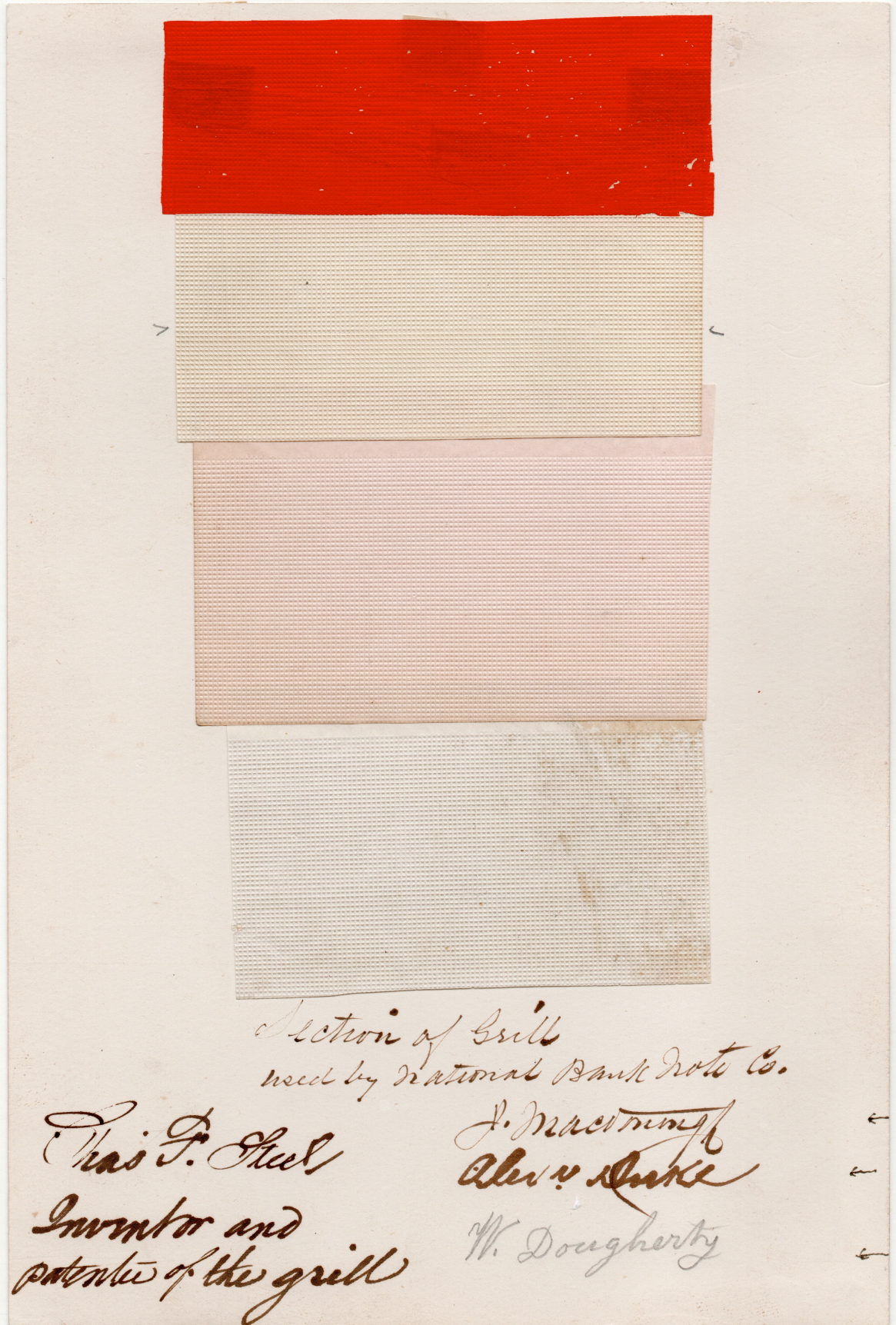
On **October 23 1867**, Zevely wrote to Steel to let him know that the NBNC would at last recognize his patent, saying "*I think your company will finally do you justice...*"

Ex-Finkelburg

The only essay signed by the NBNC, recognizing that Steel invented the 'grill'.

Steel had been trying to interest the NBNC in his 'grill' idea since 1865.

Zevely's letter helps to date the essay.



Ungummed "Biscuit" grill on colored papers stuck to card

On **November 6**, MacDonough invited Steel to show him 'ideas' for a new stamp

"Friend Steel... whenever you can find time to come over and see me please do so, bringing your ideas (if you have any) for the stamp you desire to have made..."

One recorded



Faded red-brown
Die on gray wove paper

Ex-Drews

The faint but **important** pencil note records 'Steel Nature' and is signed by the PO's MacDonald

On **November 15**, MacDonough wrote to Steel about the NBNC's experiments

"I send you the first impression made under your instructions... The die must be deepened around the figure '3'..."

One recorded



Deep pink
On yellow laid paper
Partially gummed

Ex-Finkelburg

The hand-colored '3' appears to be an attempt to **fix the problem** noted by MacDonough

Two recorded



Deep pink
On white wove
Gummed

This essay **test-cancels** Steel's design

Additional essays for Steel's surface printed design (see reference below)

1. Steel used the flattened pyramid for his '3 in circle' experiments



'3 in circle' grill.
Tan paper, perf 12, gummed

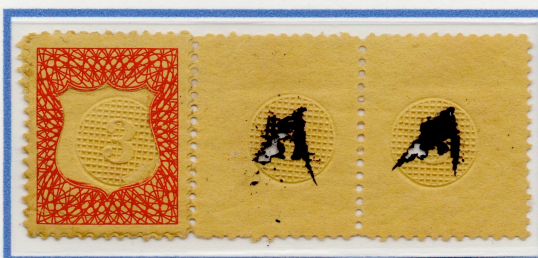
Steel's patent calls for **pressure**
to flatten the embossing.
This essay records 'a half hour's
pressure after embossing'



2. Model: He created a model combining his 'shield' design with an embossed '3 in circle'

Frame pasted over
'3 in circle'
Perf 12, gummed

Ex-Finkelburg
One recorded



Orange paper,
Red frame

Tests a pen
and ink cancel

3. He tested his typographic 'shield' design in blue with earlier grills



Flat square grill

Yellowish tinted paper
Imperf, ungummed

This fragment is
the **only one known**
on tinted paper

Ex-
Tilles

Blue on white wove
Imperf, gummed

'All over' pyramid grill



Research: the correspondence in the **Brazer Archive** proves that the NBNC were reluctant to support Steel's proposal. These 'punctured paper' essays appear to be an attempt to sidestep Steel.

Scratch pattern and 'Music Box' grills: undated

Scratch pattern grills (undated): imperf and ungummed on white wove paper

Ex- Brazer, Finkelburg, Drews

One of each recorded



Oval



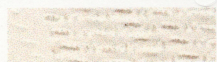
Cross



Oval



Star



Mainly horizontal scratches



Short vertical scratches



Greek-style pattern

The 'Music Box' grills: plates of the 1861 3c stamp

Two recorded



Rose
Points down
irregular

CDS: Sept 24,
1867. New York



Rose
Regular
Points down

One imperf
essay recorded



Pen cancel test of
the pin holes

Rose
Ungummed
Regular pattern,
points down

e: PSE

Rose
Irregular pattern
points down

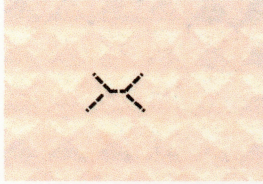
Imprint block



On **December 16 1867**, Zevly ordered **Z-grill experiments on tinted papers**

The only 1861 denominations essayed were the 1c, 3c, and 12c

The paper: "... should be very slightly **tinted** in various colors to suit the colors of the stamps... affording additional protection against all attempts to remove the cancelling marks"



A scan shows the 'rooftop' shape of the Z-grill



Sample of the Z-grill on white wove

1c frame on stamp paper: imperf or partially perfed 12, gummed



Red brown on Pink



Red brown on White

Red brown on yellow



Two recorded

Ex-Lake Shore



Brown red

3c on various tinted papers: gummed, perf 12



Green on Green



Red on Salmon



Brown on Pale violet



Red on Green

Brown on Salmon laid paper



Black on Yellow



Red on Yellow



Brown on Yellow



Red on Straw



In **January 1868**, the Z-grill became the first generally distributed grill stamp

Dimensions: 11-14 x 18-21 points: 11-11.5 x 13.5-14 mm

12c essays on various tinted papers: gummed, perf 12



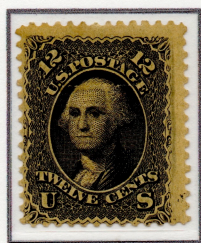
Green on
White



Brown on
Straw



Black on
Lilac



Black on
Yellow



Black on
Salmon



Brown on
Green



Brown on
Pink



Brown on
Yellow

The only denominations known to have been used in January 1868, were the 2c and 3c



e: PSE

Black, points down, p12
EKU: 17 January



e: PSE

Rose, points down, p12
EKU: 29 January

Research Summary: Postal use from the experimental A-grill to the officially distributed Z-grill*

A grill: 10 000 sheets ordered for **postal trials** on July 26, 1867. EKU: August 17, 1867

C grill: 1 000 000 stamps ordered for **postal trials** on October 16, 1867. EKU: November 16, 1867

Z grill: ordered for general distribution; 2c and 3c known used in January, 12c in February. Dates for the 1c and 15c unknown. Replaced by the D, E, and F grills from February through August, 1868.