Part IB.

The Toppan Carpenter Plates and the Guide Reliefing Method

by Richard Celler and Elliot Omiya

Introduction

This article provides new information about the plates of the U.S. 1851-57 issue and corrects misconceptions that have confused collectors and students over the years. It focuses on improving our understanding of the process that was used to transfer the stamp designs to the plates for all the various stamps produced by Toppan, Carpenter, Casilear & Co. (TCC&Co) from 1851 to about 1860. In doing so it helps us to understand the full picture of why the major Scott numbered varieties (Type I, II, III, etc.) exist on these issues.

Very little has been written about how these plates were made, and most of that was written between thirty and seventy years ago. Some of that published material has proven to be wrong or incomplete, but has never been corrected. The early writers and pioneer specialists, such as Chase, Ashbrook, Perry and Neinken simply did not have all the information we have today. We now have available two excellent books about postage stamp engraving and plate-making, which we refer to as "Baxter" and "Williams."[1] We also enjoy the benefits of an additional thirty to seventy years of study by serious specialists of the stamps of the 1851 to 1857 issue. This article relates some of their key discoveries for the first time, and pieces together information from many sources into a comprehensive picture.

Overview

In late April of 1851, TCC&Co was awarded the government contract to print the new postage stamps that were required because of the change in postage rates enacted on March 3, 1851 and effective July 1, 1851.[2] TCC&Co's principal business was printing bank notes, and postage stamps were a new field to them. In examining the stamps of the 1851-57 issues 150 years later, it is clear that they encountered a great deal of difficulty creating the plates that printed these stamps.

The methods TCC&Co developed to overcome their difficulties caused many of the varieties we find on the stamps of these issues, and the study of these varieties has provided countless hours of enjoyment for many collectors. Chase, Ashbrook and Neinken wrote definitive books about their studies of these stamps, including detailed sections on the stamp types, the plates, the process used to make the plates and the major plate varieties. Elliott Perry further advanced our understanding when he discovered what he called the "guide reliefing" process.[3] The U.S. Philatelic Classics Society was formed to promote the continued advancement of their work. Overall, the 1851-57 period produced the most studied series of stamps ever issued by the United States.

Even with all that study, there are still new discoveries to be explained. Before getting into an in-depth discussion, the key findings can be summarized.

First, the underlying reason why TCC&Co was unable to produce full-design stamps is a problem in the transfer process called "ironing-out." It arose because the stamps were placed too close together on the plate. Ironing-out takes place when a transfer roll partially obliterates a previously entered design that is too close. As will be discussed, it was the combination of ironing-out and the apparent limitations of their transfer press that led to the need for multiple reliefs on the transfer roll. As will be seen, the use of these multiple reliefs did not fully solve the problem.

Second, understanding the ironing-out problem helps explain the cause of many of the major types listed in Scott's Catalogue. The early writers on these issues proposed various explanations for the types. Some believed the stamp designs were shortened at top and bottom primarily to leave more room between the stamps. Some believed that the design was occasionally left intact only at the top of the top row of stamps and the bottom of the bottom row of stamps for aesthetic reasons. We will demonstrate that ironing-out dictated why TCC&Co made the plates as they did.

Third, a new theory is now presented which explains precisely what function the guide (or position) dots played in the transferring process. Even Elliott Perry, who discovered the guide reliefing process, did not understand why these dots were placed where we find them. Some of the dots seemed unnecessary in his mind because the use of the entry just above the one being rocked in should have been a sufficient guide. What Perry wasn't able to figure out was exactly what role a device called a "side point" played, and how certain adjustments were made during its use.

Figure 1. Typical die from the mid-1800s. This die was used to print the 11-E2 essay.

Fourth, now that the use of these guide dots is understood, it can be demonstrated that the number of guide dots on a plate is a direct function of the number of reliefs on the transfer roll. For example, there are 100 guide dots on 200-subject plates made with 3-relief rollers, 60 guide dots for 4-relief rollers, and 40 guide dots for 6-relief transfer rolls.

Fifth, this understanding of the relationship between guide dots and the number of reliefs on a transfer roll has led to the conclusion that the 12¢ plate 1 was made using a 2-relief roller. This plate had 180 guide dots, and was therefore made with a 2-relief transfer roll. Most prior students had concluded a 1-relief roller had been used.

Finally, it can now be demonstrated that TCC&Co made every stamp plate between 1851 and sometime in 1860 using essentially the same procedure. Thus, the details of plate manufacture that will be discussed in the balance of this article may be applied to each of these plates.

The sections that follow provide explanations of how these conclusions were reached, and include a detailed discussion of the processes used by TCC&Co in making the plates.

The Intaglio Printing Process

TCC&Co printed stamps from steel plates using the intaglio (or line engraving) process. This is the process used by the Perkins Bacon firm as described in Ashbrook.[4] All of the TCC&Co stamp plates had 200 subjects, arranged as two panes of 100 side by side. There are five basic steps, which can be summarized as follows:

1. Engrave a stamp design (in recess) on a "soft" flat piece of steel (the die, see Figure 1).

2. Harden the die.

3. Transfer (or "pick up") the stamp design onto a "soft" steel transfer roll (the master transfer roll). The stamp design on the transfer roll is raised, or "in relief." See Figure 2 and Figure 3, which illustrate a typical transfer roll. A transfer press is used for this purpose, and it rocks the transfer roll back and forth over the die. The design on the transfer roll will be referred to as a "relief."

4. Harden the transfer roll.

5. Transfer the stamp design from the transfer roll to the "soft" steel printing plate (in recess) by rocking the transfer roll back and forth over the plate (see Figures 4 through 8).[5]

Figure 2. Transfer roll. Two oval reliefs can be seen on the curved surface. The darkened lines at top mark the top, middle, and bottom of each relief. These reliefs were spaced far apart, and were used one at a time. Courtesy of Michael Bean.

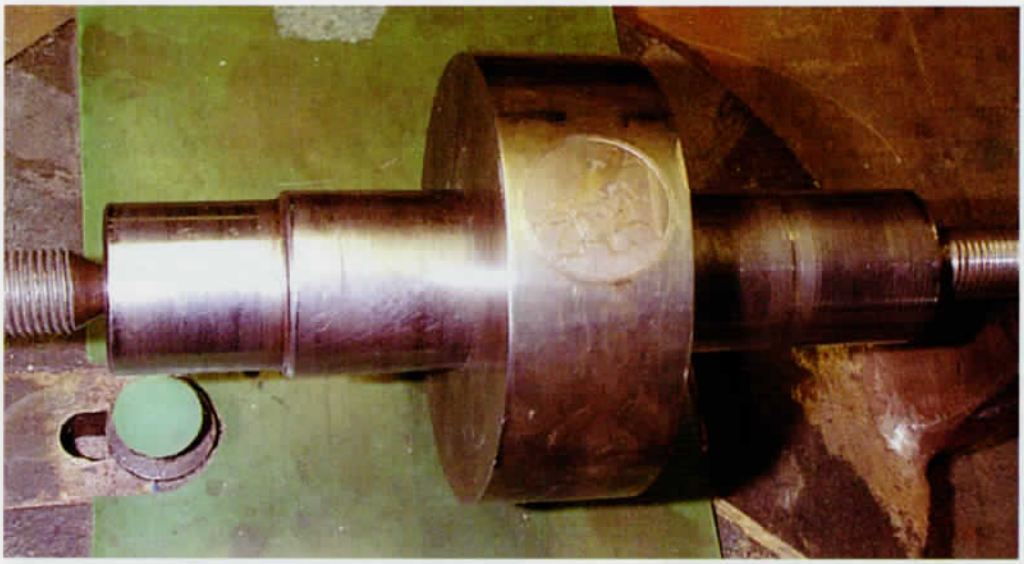

Figure 3. Transfer roll mounted on mandrel (or axle). One circular relief can be seen on the transfer roll. Courtesy of Michael Bean.

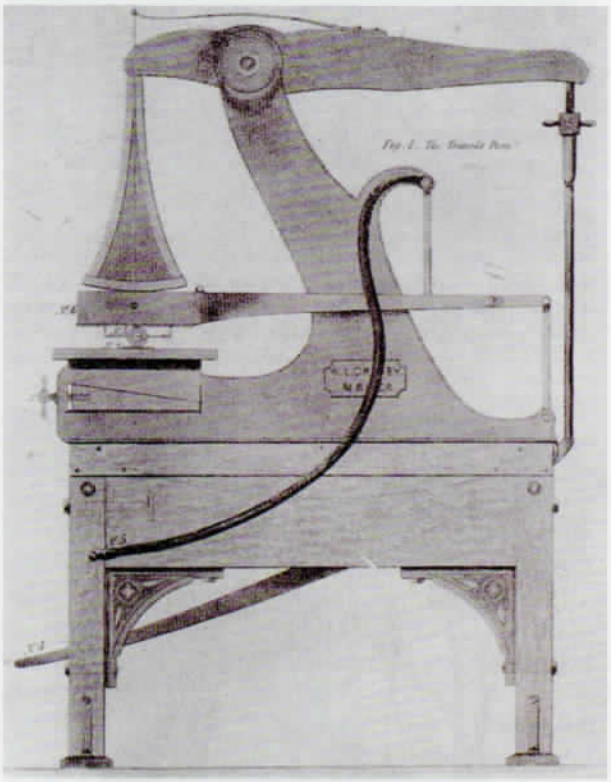

Figure 4. Transfer press built in 1852 by W. L. Ormsby[6]

Step 5 is repeated until the required number of stamp designs (200 in this case) has been transferred to the plate.

There may be a sixth step, hardening the plate to make it last longer.

Some TCC&Co plates were hardened, and some were not. This is outside the scope of the present article.

In order to provide a feeling of how a transfer press operates, Figure 7 and Figure 8 picture several views of a transfer press circa the first half of the twentieth century.

When transferring the designs to the plate in Step 5, the transfer press operator (siderographer) must have a way to locate each plate entry in its proper position. The usual method used by engraving firms of the period was to incise or punch a guide dot into the plate's surface, one guide dot for each transfer roll setting.[7] The placement of the guide dots was carefully planned so that each entry would be in the proper position. All the guide dots were put on the plate before transferring began.

The diagram in Figure 9 illustrates the layout of a typical 100-subject plate with 100 guide dots. The arrows pointing to the left of the several small rectangles point to where the controlling guide dots would be located.

Figure 5. Transfer press of the 1860s

Figure 6. Transfer press circa 1930 showing partially entered plate

A device called a "side point" was fastened alongside the transfer roll, around the mandrel (see Figure 10 and Figure 11). The siderographer would drop the tip of the side point into the guide dot. This assured that the transfer roll was in the correct position to transfer the entry to the plate.

Thus, to create a 200-subject stamp plate from a transfer roll containing a single relief, it was necessary to have 200 guide dots on the plate. Each guide dot positioned the transfer roll for the entry of one stamp design. The 5¢ and 10¢ 1847 issue stamps, produced by the firm of Rawdon, Wright, Hatch & Edson, were made using this method: 200 separate entries from a transfer roll containing a single relief.

The Problem TCC&Co Faced When Using a Single-Relief Transfer Roll

It appears likely that TCC&Co would have planned to use a single relief transfer roll. That was, and still is, the standard practice of engraving firms. The reason for not using multiple reliefs is described by Baxter:

> From time to time, experiments have been made in various engraving establishments in producing from two to as many as 26 reliefs on a single roll and entering that many subjects in a single operation. Because of the enormous pressure required (which has a tendency to distend the plate) multiple reliefs, in most cases, have been found impractical, and the practice of entering subjects one at a time prevails in most engraving plants."[3]

Figure 7. Two views of an early 20th century transfer press. Left: View from the siderographer's viewpoint. Right: View from the back of the press. Courtesy of Michael Bean.

Figure 8. Michael Bean demonstrating a transfer press. The large wheel in his right hand moves the sliding bed forwards and back. The foot lever is pressed to create the pressure between the transfer roll and the plate.

Based on the evidence seen by studying the printed stamps, all of the 1851-1857 plates were manufactured using closely spaced, multiple-relief transfer rolls. Two or more reliefs were entered on the plates in a single operation. The question that has plagued students is *why*? What was wrong with using single relief transfer rolls?

In the past, there have been a number of attempts to answer this question. Some authors have concluded that there was a top-to-bottom height restriction imposed by the transfer press.[9] They measured panes of stamps top to bottom and found that the maximum height of a vertical column of ten stamps was 259½mm, and thus concluded that this was the maximum effective distance the bed of the transfer press could travel. Others have suggested multiple reliefs were used so that columns of stamps would be aligned vertically, with consistent spacing between stamps.[10] Another reason proposed was that a multiple relief roll required fewer transfer roll

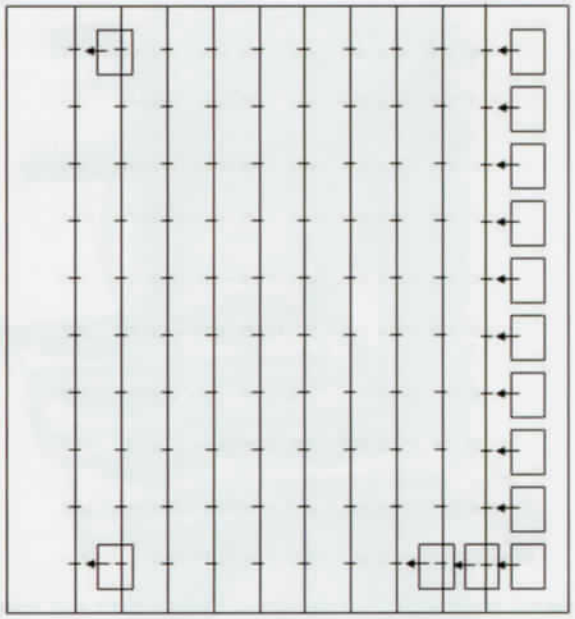

Figure 9. Diagram showing layout of a 100-subject plate. A guide dot is located at each cross-hatch point in this diagram. The small rectangles represent several illustrative stamps, and the arrows point to the guide dots which were used to position the entry of those stamps.

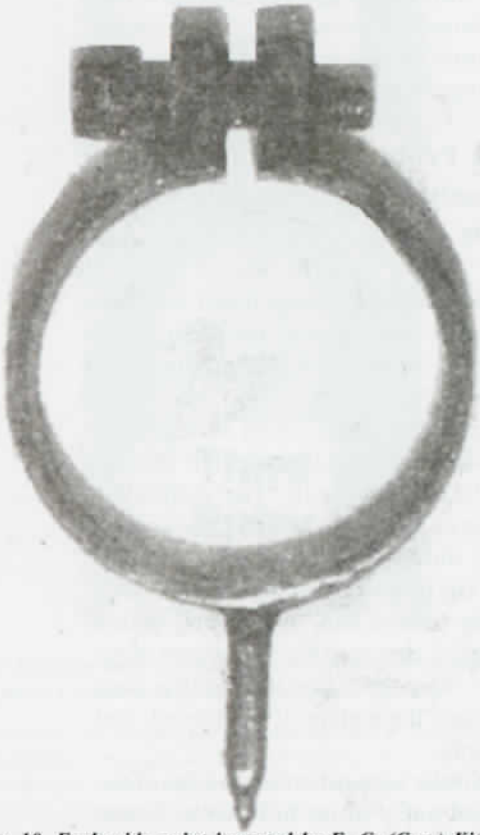

Figure 10. Early side point invented by E. C. (Cap.) Kittle. It clamps around the mandrel alongside the transfer roll.

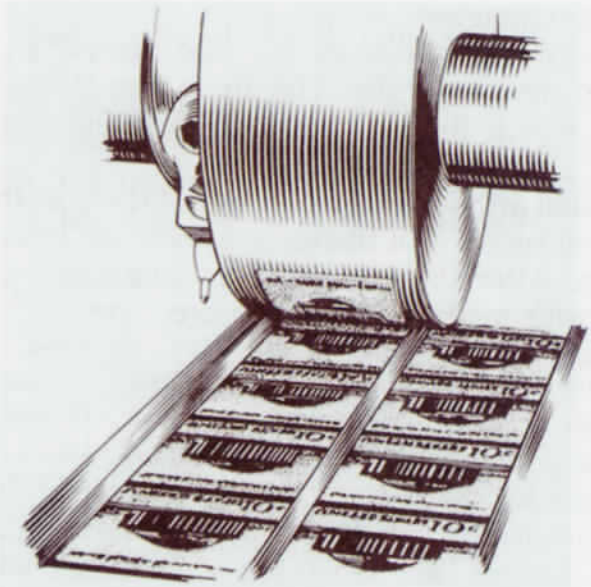

Figure 11. Transfer roll showing a more modern side point fastened at left, around the mandrel. Illustration courtesy of Scott Publishing Co., as shown in current editions of the Scott Standard Postage Stamp Catalogue, p. 25A.

settings, and thus saved time and effort. The authors, however, believe the fundamental reason TCC&Co chose multiple reliefs was to overcome the ironing-out problem.[11]

The Problem of Transferring Closely Spaced Stamps to the Plate

The ornate 1¢ design posed the most serious ironing-out problem, and therefore we will use it for illustration (see Figure 12).

A siderographer could successfully transfer the first entry to a plate using a 1-relief transfer roll. The difficulty, however, lay in transferring the *second* entry, the one *below* the first (see Figure 13). The problem was that the blank area on the transfer roll, immediately above the relief, *damaged the bottom part of the previous entry*. The third entry then damaged the bottom of the second, and so forth.

In order to transfer the top edge of the second entry to its full depth, it was necessary to "over-rock" the transfer roll far enough upwards so that the blank part of the roll (above the design) passed over and *partially ironed out* the recessed lines at the bottom of the first entry.[12] *Ironing-out of the design occurred because the stamps on the plate were spaced too closely together vertically.*

It can be seen in Figure 12 that the delicate and elaborate bottom ornaments would have been particularly susceptible to the ironing-out process. Engraving firms were well aware of the ironing-out problem (also sometimes referred to as "press out").

Williams states:

> Over-rocking of the relief roller . . . can produce the effect of weakening the lines, or some of them, of an entry already made. Because of the plasticity of the metal, [this tends] to fill in the lines of adjacent subjects, causing them to yield unsatisfactory prints in the parts affected. Many instances of "short transfer" and "incomplete transfer" result from these causes, termed "ironing out".[13]

Figure 12. 1¢ full-design die proof

Baxter describes it as follows:

> Care must be taken in rocking-in the second, as well as the subsequent impressions, or the blank section of the transfer roll will overlap the design previously transferred. If the pressure is not slightly decreased as soon as the bottom edge of the relief contacts the plate on the return roll, the transfer roll will invariably press into the top of the intaglio impression below, ironing-out some of the lines. Almost all the so-called "short-transfers," especially those incomplete at the top, are formed in this manner, and not, as is commonly supposed, by an incomplete passage of the relief roll over the plate.[14]

This is the crux of the problem that led TCC&Co to "guide reliefing." It seems obvious that they could have avoided it by simply putting the stamps further apart. As already discussed, there may have been a restriction on how far the bed of their transfer press or presses could move, thus limiting the total distance from top to bottom available for entering the designs on the plate. One thing to keep in mind is that the typical plate TCC&Co was accustomed to making for printing banknotes was about two-thirds the size of a 200-subject stamp plate, so larger stamp plates might well have tested the limits of their transfer presses.

Since they apparently couldn't put more space between stamps, TCC&Co devised the guide reliefing method of transferring designs to the plates to get around the ironing-out problem. Their solution was to use a guide relief,[15] an additional relief on the transfer roll. The raised lines on the guide relief exactly meshed into the recessed lines of the previous entry. Thus, instead of having a blank portion of the transfer roll iron out the lower edge of the previous entry, the guide relief would cause little or no damage to it, provided it was properly fitted into the previous entry.

While this concept appears straightforward, TCC&Co obviously had serious technical problems creating such a closely spaced 3-relief transfer roll when making the first 1¢ plate. The difficulties become apparent when the steps required to make the transfer roll are studied in detail.[16]

Laydown Is Used to Create Multiple Relief Transfer Rolls

A laydown (or bed-piece), a small piece of "soft" steel somewhat larger than a die, is used in the creation of a multiple relief transfer roll. Baxter describes the process in this manner:

> When a multiple relief is employed, however, it is customary to utilize a laydown since it is difficult, if not impossible, to take up additional reliefs on a transfer roll when the designs are so close together.[17] The usual procedure is to take up a single subject on a roll, to harden the relief roll, and then to enter the required number of impressions in a bed-piece with this master roll. This laydown, when hardened, becomes the die from which the multiple-subject working roll, used in

Figure 13. Illustration of what the entry of three 1¢ designs to a plate using a single-relief transfer roll might look like

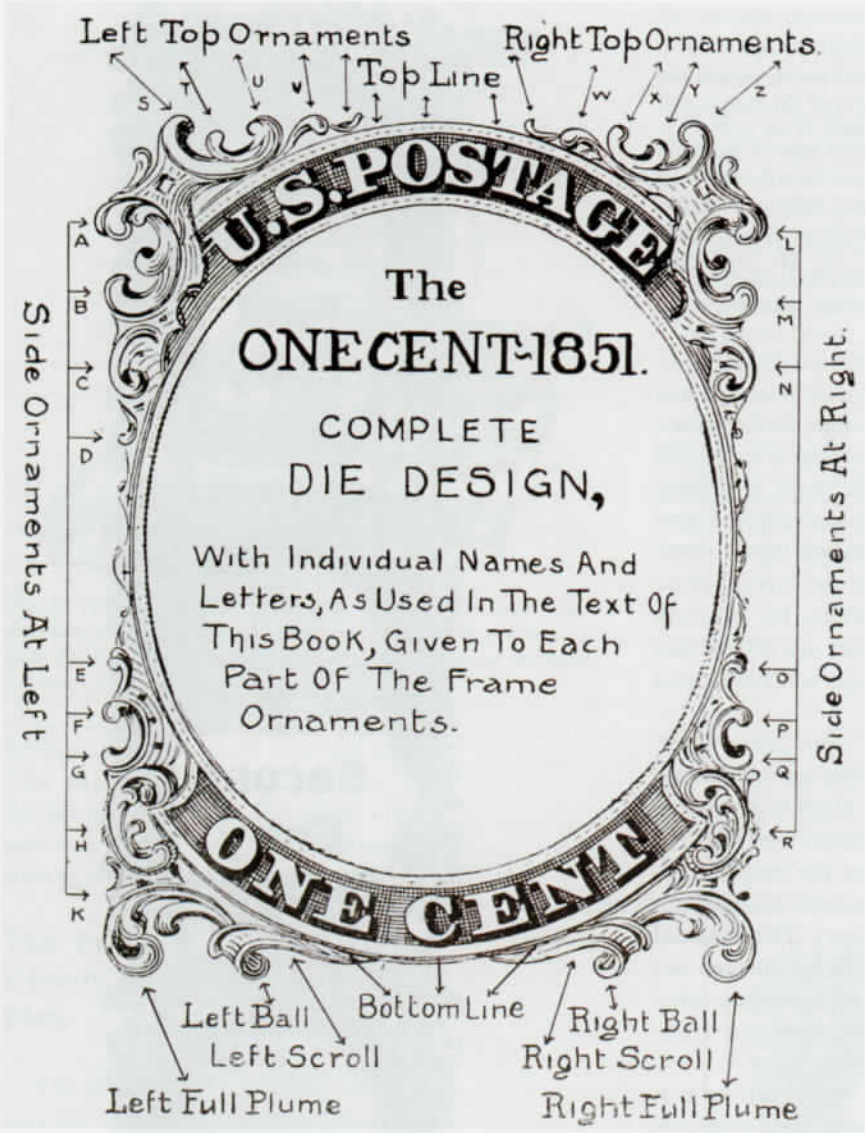

Figure 14. The 1¢ 1851 Complete Die Design Diagram

rocking-in the impressions in the printing plates, is produced."[18]

Three entries from the single-relief master transfer roll were transferred, one by one, to the laydown (instead of the plate) exactly as previously described (see Figure 13). The identical ironing-out would have occurred on the laydown, damaging the bottom edges of the designs on the top two entries. A proof printed from the laydown would have made this obvious. To avoid printing the disfigured bottom ornaments on the stamps, TCC&Co decided that the solution was to remove the bottom edges of the stamp design. Since it is much easier to remove such lines from a transfer roll (where the raised ridges can be scraped or filed off), this trimming of the bottom would have been done as part of the succeeding step.[19]

The laydown was then hardened, and a new, blank "soft" steel transfer roll (the "working transfer roll") was placed in the transfer press. All three designs were picked up from the laydown in one operation. The remains of the left and right full plumes and balls (see Figure 14) were then scraped from the bottoms of each relief on the working transfer roll. This process also caused some design shortening at the tops of the reliefs. These alterations were slightly different on each relief. This working transfer roll was subsequently hardened and used to enter the 1¢ plates 1, 2, and 3.[20]

Thus, the reason for trimming the 1¢ design and using a guide reliefing entry process becomes clear. The ironing-out effect made it mechanically impossible for TCC&Co to successfully transfer 200 closely spaced full-design stamps to the plate. It seems probable that the 10¢ stamp designs were trimmed for the same reason when plate 1 of the 10¢ stamp was made in 1855 (see Figure 15).

Figure 15. 10¢ full-design die proof (Courtesy of Michael Perlman)

It also becomes apparent why some plates have top row stamps with complete designs at the top, bottom row stamps with complete designs at the bottom, and interior stamps that are incomplete at both top and bottom.[21] The reason is simple: there was no ironing-out at the top and bottom of the plate. Suggestions have been made in the past that the designs were purposefully complete at top and bottom

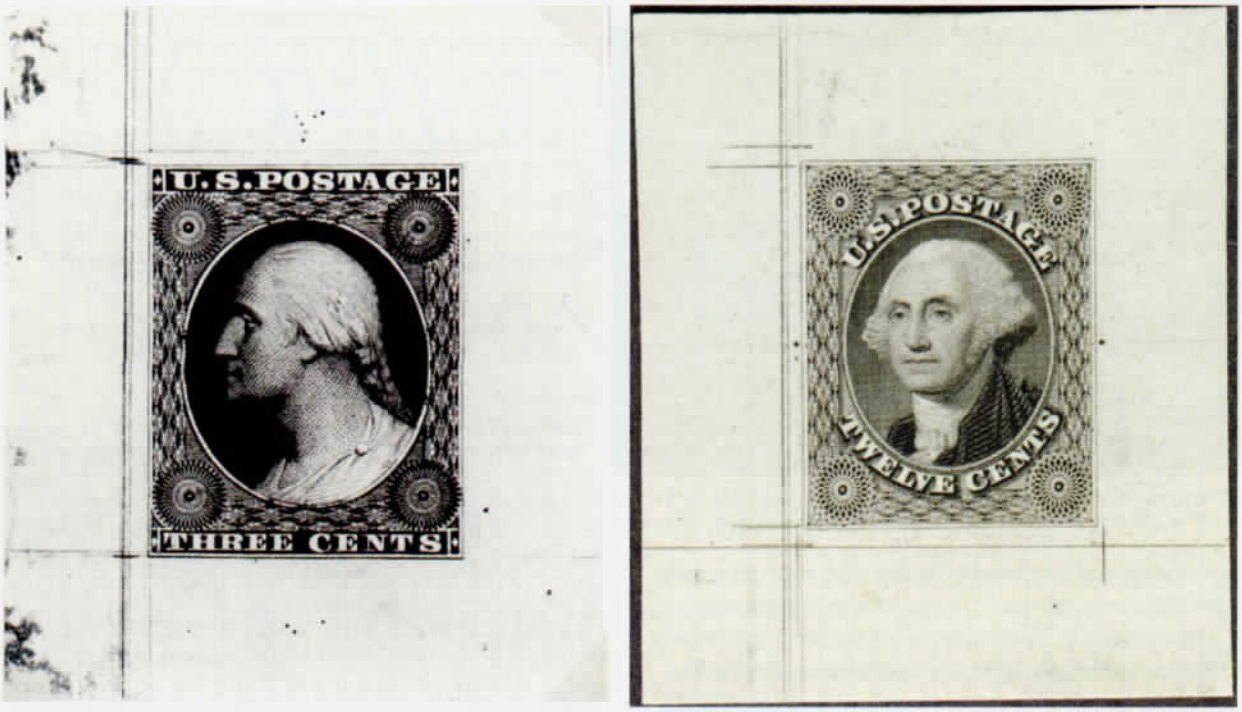

Figure 16. 3¢ and 12¢ die proofs

to improve the appearance of the sheets, *i.e.*, make them resemble a sheet where all the stamps were full-design, so as to fool the stamp agent.[22] This seems preposterous when one considers the poor quality of the millions of stamps actually accepted from TCC&Co over a ten-year period.

The ironing-out problem was much less severe for the 3¢ and 12¢ stamps, because the designs were rectangular, with a simple frame line surrounding the design on all sides (see Figure 16). The bottom frame line of these stamps was severely weakened by ironing-out. However, by recutting this frame line on each individual stamp on the plate (by careful use of a sharp engraving tool to deepen the recessed line), the weakened bottom frame lines were restored.[23]

The Use of Guide Dots

Elliott Perry has demonstrated convincingly that TCC&Co used transfer rolls having two, three, four, or six closely-spaced reliefs when making plates, and that multiple stamps were transferred from a single setting of the transfer roll.[24] Perry illustrated how over-rocking would change a previous entry's design when each relief was not completely identical (we call this "guide relief influence"). What Perry was unable to figure out was the reason for the various guide dot locations, and exactly how they were used in transferring the designs to the plate.[25] The discussion that follows will make the procedure clear.

The normal pattern of guide dots on the plate for each type of transfer roll (2-, 3-, 4- or 6-relief) is illustrated in Figure 17. It is apparent when examining the location of guide dots on the various plates that none of the plates contained as many as 200 guide dots. If a single relief transfer roll had been used, 200 guide dots would have been required, and further, each guide dot on the plate would have been located in the same relative position to the stamp whose entry it controlled (*e.g.*, the guide dot would always be, say, at the lower right hand corner of the stamp). However, we find that *on the same plate,* some guide dots are located level with the tops of stamps, while others are level with the bottoms of stamps.

Table 1 summarizes the plates TCC&Co made for the 1851-57 issues, grouped by the number of reliefs on the transfer roll.[26, 27]

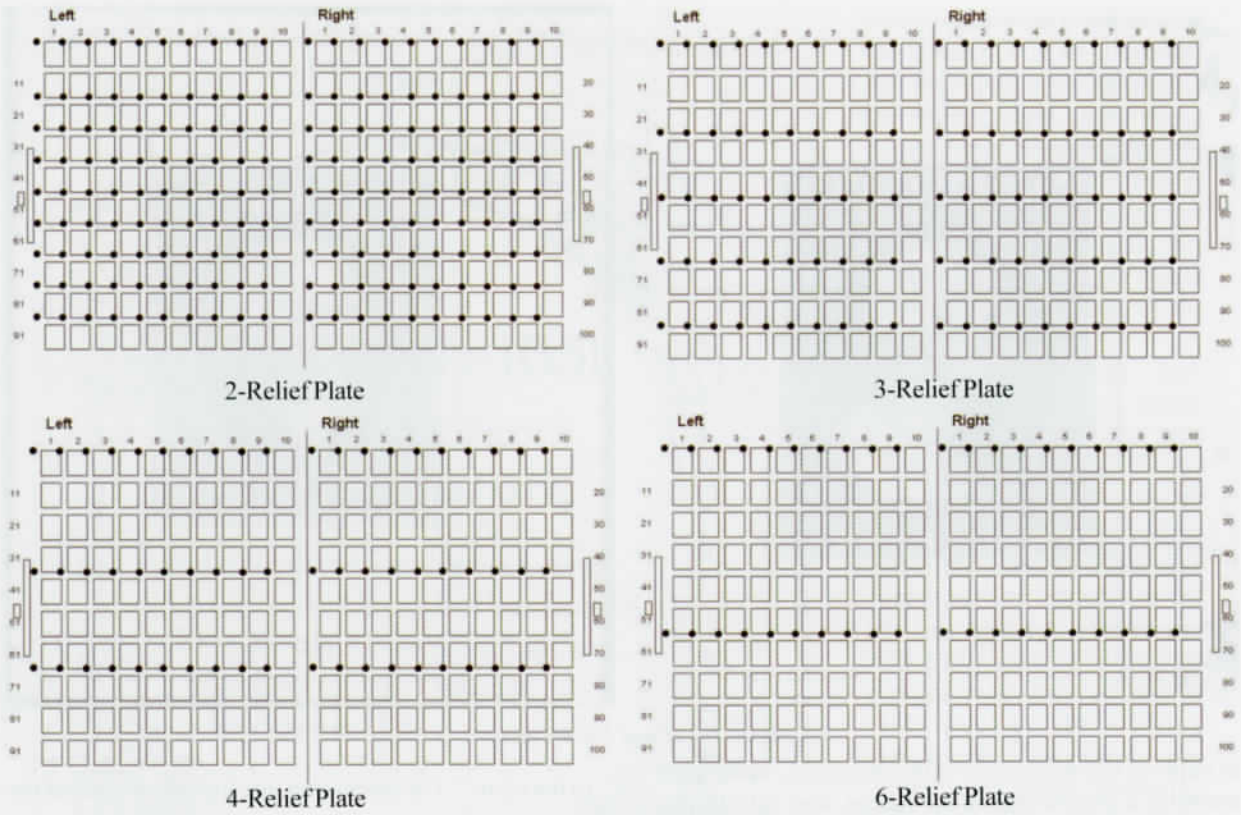

Figure 17. Guide Dot Locations on 2, 3, 4, and 6 Relief Plates

# of Reliefs	Plates	# of Guide Dots
2-Relief	12¢ plate 1,3[28]	180
3-Relief	1¢ plates 1-3, 11-12; 3¢ plates 0-8; 10¢ plate 1; Franklin Carrier plate 1	100
4-Relief	5¢ plate 1; 30¢ plate 1; 90¢ plate 1; Eagle Carrier plate 1	60
6-Relief	1¢ plates 4-5, 7-10; 3¢ plates 9-28; 5¢ plate 2; 10¢ plate 2; 24¢ plate 1	40

Table 1

Entry of the Plates (3-relief Transfer Roll)

In this section, we will describe a new theory of exactly how the guide dots were used to position the transfer roll. In this detailed illustration, we will use as an example one of the 3¢ plates made with a 3-relief transfer roll. Figure 18 is a diagram showing the guide dot locations on a 3-relief plate. Figure 19 is a drawing of the 3-relief transfer roll used to enter the early 3¢ plates, with relief "C" at the top, relief "A" in the middle and

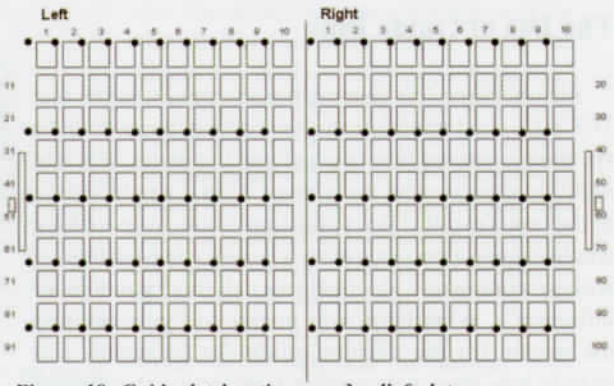

Figure 18. Guide dot locations on 3-relief plate

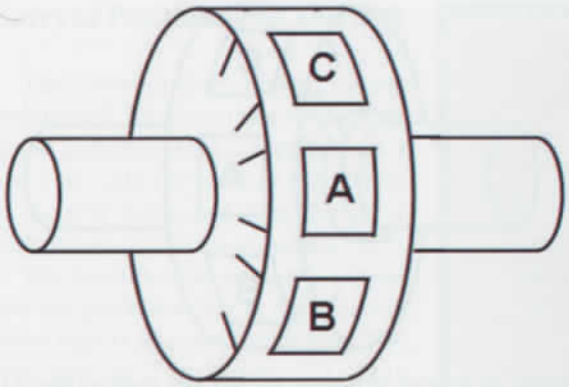

Figure 19. Drawing of 3-relief transfer roll with marks scribed on the flat side even with the top and bottom edge of each relief

relief "B" at the bottom. Other plates entered with a 3-relief transfer roll would have been entered in a similar manner.[29]

Engraving firms normally incise marks on the side of transfer rolls level with the center, top and bottom of each relief on the roll.[30] The siderographer uses these marks as an aid in affixing the side point alongside the transfer roll, as well as in judging where to end each rock of the transfer roll (see Figure 20).

It is not known what the actual transfer press (or presses) used by TCC&Co looked like. It may have resembled the contemporary ones shown in Figures 4 and 5. It no doubt was not as advanced as the presses shown in Figures 6, 7 and 8, but the principles of operation would have been very similar. In the ensuing discussion, the more modern transfer press will be used for ease of illustration.

The plate is placed on the bed of the transfer press, where it is free to move in any direction. A transfer press usually has an adjustable guide at one or both sides to

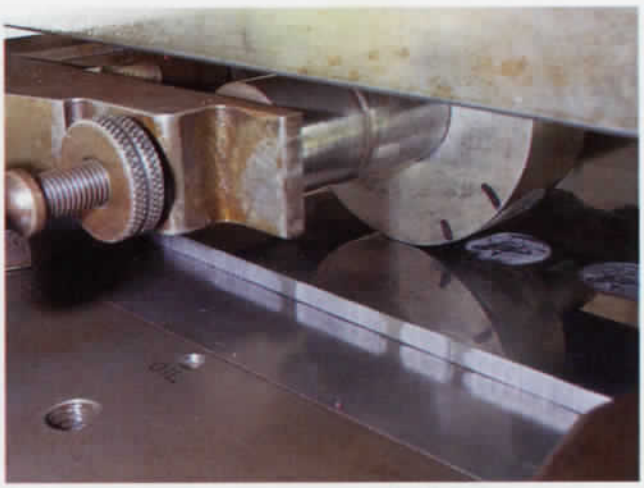

Figure 20. Transfer roll in transfer press, showing marks on side of roll at top and bottom of relief. Courtesy of Michael Bean.

make the plate parallel with the side of the transfer roll prior to applying pressure.[31] Once the plate is aligned properly, it can be fastened in place. The first entry is normally placed in the lower right-hand corner of the plate.[32]

Entry of the first three positions (10R, 20R, and 30R)

A side point similar to the one shown in Figure 10 was placed around the mandrel at the left side of the transfer roll, and rotated so that the tip of the side-point was *even with the top of the first relief*, and then secured in position with the set screw (see Figure 21).

The siderographer would take the transfer roll in his hand, set the roll on the plate with the top edge of the top relief closest to him and the side point facing down, and place the tip of the side point into the controlling guide dot. This dot is located at the upper right corner of position 9R, and the dot was plainly visible because position 9R had not yet been entered. The top of the first relief (the "C") was now flush with the plate surface, and thus the "C" relief would have been the first thing transferred to the plate. The guide dot on position 9R controlled the transfer of the first three positions: 10R, 20R and 30R.[33] See Setting 1 in Figure 22.

The transfer press bed and plate, with the transfer roll sitting upon it, was slid back, away from the siderographer, until the mandrel was directly beneath the bearers, which press down on both ends of the mandrel (see Figure 23).[34]

The transfer press has a large hand-wheel at the right side that is used to move the bed (and the plate upon it) forward and back (see Figures 7 and 8). It also has an

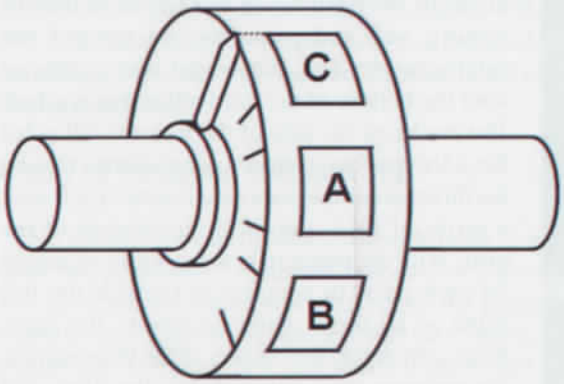

Figure 21. Drawing of transfer roll with side point positioned to top of upper ("C") relief. Used for the entry of rows 1-3.

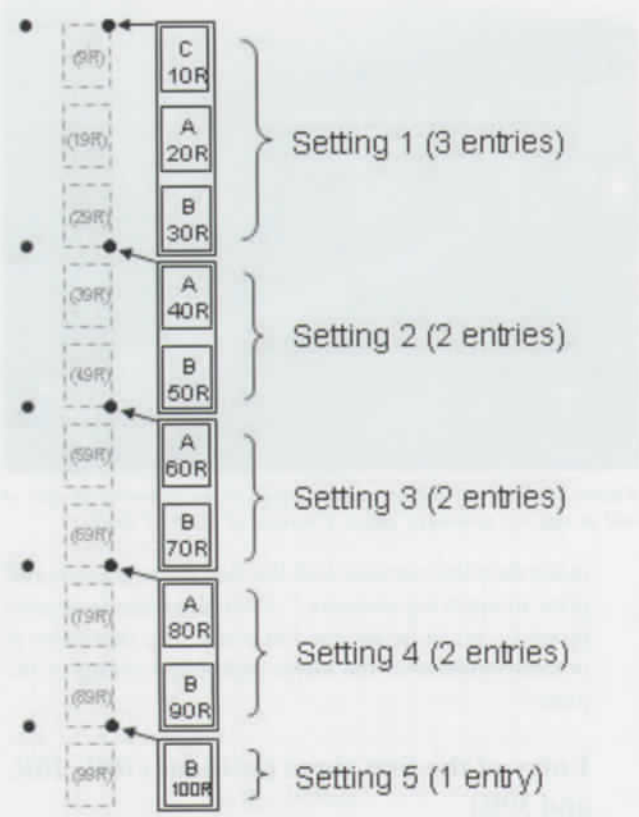

Figure 22. Diagram showing sequence of entry for the first vertical column (as viewed on printed stamps). Arrows point to the guide dot used to position the transfer roll for each of the five settings. Stamps shown as connected were transferred in a single setting. Dotted boxes at left show where the second vertical column will be entered next.

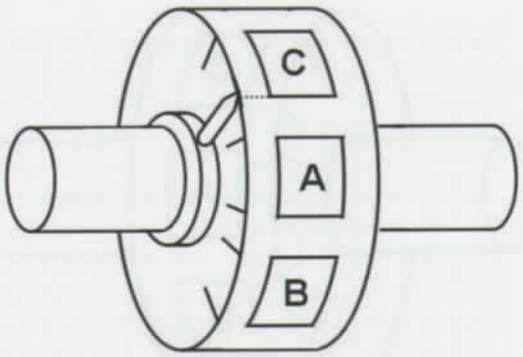

Figure 24. Drawing of transfer roll with side point positioned to bottom of upper ("C") relief. Used for the entry of rows 4-5, 6-7 and 8-9, with the "C" relief used as the guide relief.

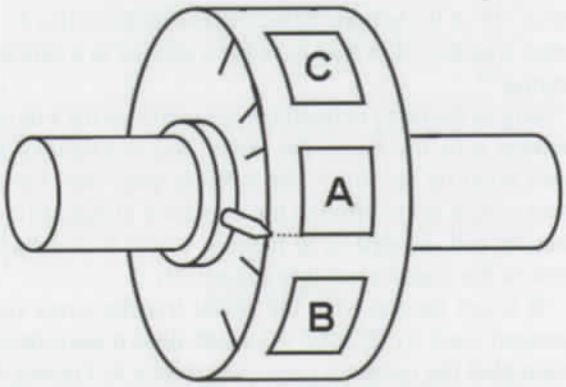

Figure 25. Drawing of transfer roll with side point positioned to bottom of middle ("A") relief. Used for the entry of row 10, with the "A" relief used as the guide relief.

adjustable foot lever, which forces the bearers downward, and is capable of applying enormous pressure. The intense pressure applied by the bearers causes the transfer roll to turn as the bed and plate are moved forward and back.

Figure 23. Transfer roll in transfer press with ends of mandrel beneath the bearers which apply the pressure. Courtesy of Michael Bean.

To begin, the hand-wheel was turned so that the sliding bed and plate moved toward the siderographer. This movement was continued until the bottom of the third relief was reached. The marks on the side of the transfer roll aided the siderographer in determining when to reverse the direction of the plate (see Figure 20). It took a series of back-and-forth movements of the plate, with the pressure being steadily increased on each pass, to completely transfer the full depth of all three stamp designs to the plate. After completing the transfer of the three entries, the pressure was released and the plate and transfer roll were slid forward from under the bearers to prepare for the next transfer.[35]

Entry of Positions 40R and 50R

The siderographer picked up the transfer roll, loosened the side point set screw, and rotated the side point until *it was even with the mark at the bottom of the first relief*, and then secured it with the set screw (see Figure 24).

The tip of the side point was placed into the guide dot that is found in the lower right (LR) corner of position 29R (see Setting 2 in Figure 22). This positioned the bottom edge of the guide relief "C" over the bottom edge of the already entered position 30R on the plate. The siderographer wiggled the transfer roll until the raised lines on the guide relief were meshed in with the recessed lines at the bottom of position 30R.[36] The guide dot provided the approximate position for the transfer roll, and the meshing in (or "dropping in") ensured the exact position.

Figure 26. 100R11i showing "11th row"

The plate with the transfer roll sitting upon it was again slid beneath the bearers and pressure applied. The back-and-forth rockings were repeated, transferring the two lower reliefs on the transfer roll, "A" and "B," to the plate (positions 40R and 50R). The guide relief was rocked partway over the lower part of position 30R to assure that the top of position 40R would be entered to its full depth. However, the bottom of 30R was *not* pressed out, *because of the mesh of the guide relief.* Due to the minor differences in each 3¢ relief, the characteristics of the bottom of the "C" (guide) relief would be superimposed over the bottom of the guided into position 30R, a "B" relief.[37] The extent of the guide relief influence depended largely on how far and how strongly the siderographer happened to rock the guide relief into its guide position.[38] After positions 40R and 50R had been entered, the pressure was released and the plate and transfer roll were slid forward to get ready for the next transfer.

Entry of Positions 60R and 70R

No adjustment was needed to the side point to enter these two positions. It remained as shown in Figure 24. The tip of the side point was placed into the guide dot found in the LR corner of position 49R (see Setting 3 in Figure 22). The same procedure used to enter 40R and 50R was repeated to enter 60R and 70R.

Entry of Positions 80R and 90R

Again, no adjustment was needed to the side point for these entries. The tip of the side point was placed into the guide dot found in the LR corner of position 69R (see Setting 4 in Figure 22). The procedure described above was repeated to enter 80R and 90R.

Entry of Position 100R

At this point, the siderographer needed to adjust the side point so that the middle relief (instead of the top relief) would be the guide relief. He repositioned the side point until it was *even with the mark at the bottom of the second relief* and secured it (see Figure 25). We call this change in guide relief the "*10th row adjustment.*" Its purpose will be described below.

The siderographer placed the tip of the side point into the guide dot found in the LR corner of position 89R (see Setting 5 in Figure 22). This positioned the bottom edge of the *middle* relief on the roll (the "A"

Figure 27. Close-up of top edge of 3¢ stamp design appearing in the bottom margin below position 100R11i. The stamp below has been superimposed in order to demonstrate that this line is the top edge of another stamp.

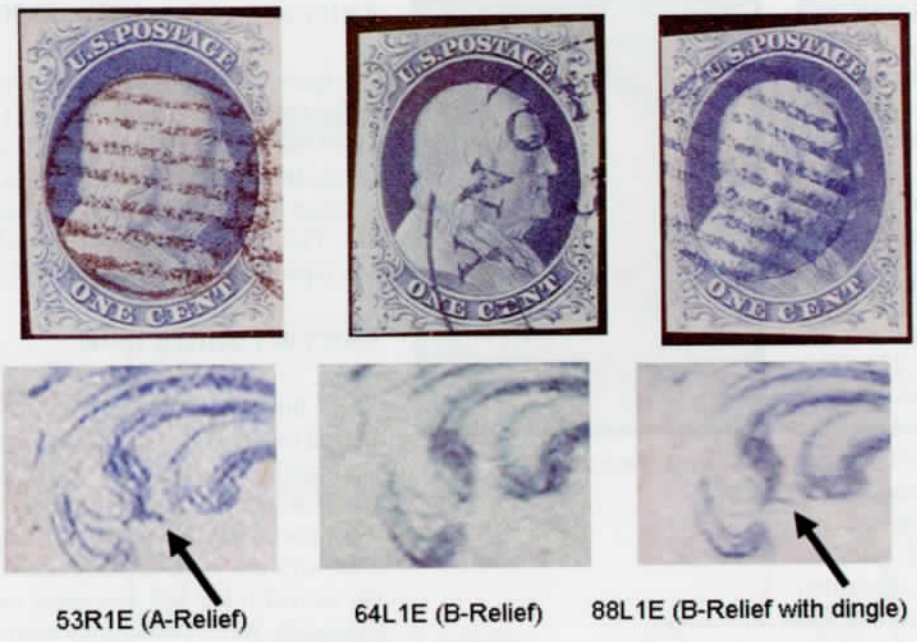

Figure 28. 1¢ "A," "B" and 9th row "B" reliefs to illustrate "the dingle"

relief) over the bottom edge of position 90R on the plate. *Thus, the "A" relief became the guide relief.* The third relief on the transfer roll, (the "B" relief), was transferred to the plate as position 100R. The over-rocking of the "A" guide relief into position 90R (which was a "B" relief) superimposed "A" relief characteristics into position 90R, instead of "C" relief characteristics, which had been superimposed into positions 30R, 50R and 70R.

Reason for the 10th Row Adjustment

The purpose of the 10th row adjustment was to prevent the transfer of the top of a partial additional entry (an "11th row") into the bottom margin below the tenth row stamp. If the top relief had been used as the guide relief when entering position 100R (or any bottom row position), the middle relief would have rocked in position 100R. The over-rocking needed to fully enter the bottom of 100R into the plate would have entered a small portion of the top part of the bottom "B" relief on the transfer roll into the bottom margin of the plate.

Undoubtedly the best example of an "11th row" transfer is found below position 100R11i of the 3¢ stamp, illustrated in Figure 26.[39] An irregular horizontal line can be seen in the bottom margin 1.0mm below the bottom edge of the stamp. This line is actually the top edge of the "US POSTAGE" label, as demonstrated in Figure 27. The removal of these extraneous marks on the plate would have required additional work during the plate finishing process, and it was in order to avoid this extra work that TCC&Co devised the 10th row adjustment.

Figure 29. 97R1L showing traces of an 11th row

Figure 30. 100R2 showing traces of an 11th row

Evidence of 10th Row Adjustment (1¢ Stamp)

The three reliefs on the 1¢ transfer roll used to enter plates 1, 2 and 3 are called "T," "A" and "B" (instead of "C," "A" and "B"). Most ninth row ("B" relief) stamps on these plates show in the lower left corner a fragment (irreverently named "the dingle" by Nathan Shmalo) of the partly erased left full plume that exists only on the "A" relief (see Figure 28).

This fragment was superimposed over the bottom of the 9th row "B" reliefs because of the 10th row adjustment. In the cases where the siderographer failed (forgot?) to make the 10th row adjustment, the 9th row positions do *not* show this dingle. This is because the *top* ("T") relief was used as the guide instead of the "A" relief, and the "T" relief does not have the dingle.

TCC&Co entered the first five full vertical columns on the 1¢ Plate 1 Early (the 10R, 9R, 8R, 7R and 6R columns) without making the 10th row adjustment. Positions 96 through 100R are therefore all "A" reliefs, and these positions show traces of the 11th row in the bottom margin (see Figure 29). Positions 86 through 90R do not show the dingle. The remaining 15 entries in the bottom row are all "B" reliefs, so it appears that TCC&Co became aware of the 11th row problem after fully entering the first five columns on the plate.[40]

In addition, when plate 2 of the 1¢ was made in the fall of 1855, the 10R column was also entered without making the 10th row adjustment, resulting in position 100R2 being an "A" relief, and traces of an 11th row being created (see Figure 30). It may well be that TCC&Co made stamp plates so infrequently that they simply forgot this adjustment was needed.

There is also a slight difference in spacing between the reliefs on this transfer roll. The top ("T") and middle ("A") reliefs are 0.5mm apart, while the middle ("A") and bottom ("B") reliefs are 0.6mm apart. Measuring the distance between a 9th and 10th row stamp is another method of determining which relief was used as the guide relief for entering the 10th row position. These guide relief effects were first discovered by Nathan Shmalo and Mark Rogers.[41]

Evidence of 10th Row Adjustment (Franklin Carrier Stamp)

The Franklin Carrier plate was entered using a 3-relief roll, and the spacing between the upper and middle reliefs is noticeably wider than the spacing between the middle and lower reliefs. As can be seen in Figure 31, the horizontal gutters below rows 1, 3, 5 and 7 are wider than below rows 2, 4, 6, 8 and 9. The narrow gutter below the ninth row demonstrates that the middle relief on the transfer roll was the guide relief when the tenth

Figure 31. The left three vertical columns, left pane, of the Franklin Carrier reprint showing variation in the space between horizontal rows. The upper five rows are India white paper proofs and the lower five rows are the first issue of reprints on rose paper (Scott LO3).

row was entered, proving that the 10th row adjustment was made.

Figure 32 shows two enlargements from Figure 31 to better illustrate the spacing differences. The left pair, positions 61-71L1, shows the wider spacing below 61L1 (a seventh row stamp) and the narrower spacing below the sixth and eighth rows (above 61L1 and below 71L1). The right pair, positions 81-91L1, shows the narrower spacing below 81L1 (a ninth row stamp) as well as the narrower spacing below the eighth row (above 81L1).

Figure 32. Enlargements from Figure 31 to illustrate differences in horizontal spacing.

Figure 33. 78-80R2/98-100R2 showing the misplaced entry of 99R2

Additional Evidence in Support of the Guide Dot Usage Method

The distance and alignment of many guide dots do not line up precisely with the position(s) they controlled. This can be explained because the guide dots were used to provide an *approximate* location of the transfer roll before the siderographer dropped in the guide relief. What happens when a guide dot is severely misplaced?

Two examples of grossly misplaced guide dots on the 1¢ plates can be cited. The first misplaced guide dot is in the lower right corner of 88R2, and it controlled the entry of 99R2, the well-known Type III. This dot was placed significantly lower than it should have been.[42] It was used to control the *original* entry of 99R2, which was entered noticeably low and to the right (see Figure 33).

An enlargement of positions 98-99R2 from the block in Figure 33 is illustrated in Figure 34, and it shows the misplaced guide dot used for 99R2, as well as the normally-placed guide dot used for the entry of 98R2.

It isn't known why the "dropping in" of the guide relief did not locate the bottom of 89R2. It probably was too far away to mesh in, and the siderographer did not detect this until it was too late.

It also isn't known why the first entry of 99R2 is shifted to the right when the guide dot is shifted down but not to the right. We leave this for the next

Figure 34. 98-99R2 with 99R2 showing the misplaced guide dot (too low) at the lower right corner of 88R2

generation of students.

Since the guide relief had failed to mesh into position 89R2, the upward over-rocking during the original entry of position 99R2 created the strong double transfer at the bottom of 89R2, as can be seen in Figure 34.

In order to correct the out-of-place entry of 99R2, TCC&Co erased and fresh-entered 99R2 to make it even with the other bottom row stamps. This fresh entry was not rocked in fully at the top *(i.e.*, it was short-transferred), evidently to avoid further disfiguring 89R2 and having to fresh-enter that position as well.[43] Ashbrook states that 99R2 was also short-transferred at the bottom, although "there was no occasion to do so." Another plausible explanation is that the bottom of 99R2 is incomplete because there were significant remnants of the too-low original entry in the bottom margin even after the fresh entry, and the burnishing needed to remove them erased the bottom of 99R2.

Many traces of the misplaced original entry of 99R2

Figure 35. Arrows at right point to strong remnants of first entry of 99R2

Figure 36. 61-62R9 pair showing low placement of 62R9. The horizontal dotted line even with the top of the head has been added to illustrate this.

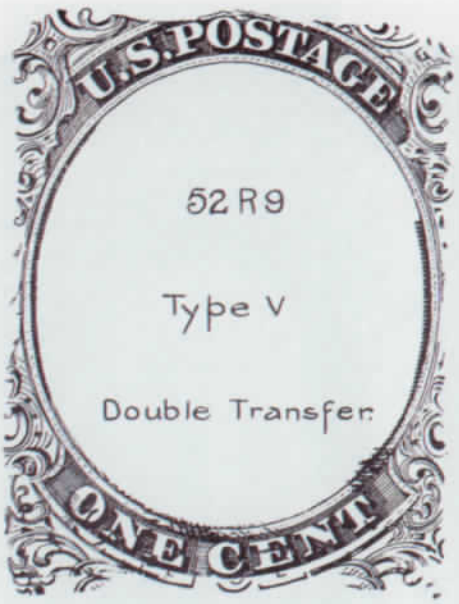

Figure 37. Diagram of 52R9

are visible as the double transfer, particularly at the right side (see Figure 35). The likely reason the fresh entry of 99R2 was not moved further left to where it should have been is that the strong right-side remnants from the original entry would then have been obviously visible in the margin between 99R2 and 100R2. During the erasure procedure, these remnants could not be completely removed without damaging the 100R2 entry because the original 99R2 entry was so close to it.

The other misplaced guide dot, which is also much too low, is on 51R9.[44] This plate was entered using a 6-relief transfer roller, and the dot on 51R9 controlled the entry of 62-72-82-92R9. These four positions, entered from one setting, are too low relative to the rest of the plate, but no corrections were attempted. Illustrated in Figure 36 is a horizontal pair, positions 61-62R9, which shows the misplaced guide dot that caused the alignment problem. Additionally, the figure clearly shows that 62R9 is lower than 61R9.

The over-rocking at the top during the entry of these four positions did not mesh with position 52R9, which caused a pronounced double transfer at the bottom of 52R9 (see Figure 37), similar to the one found on 89R2. In this case, 52R9 is an "F" relief, and the doubling at the bottom is from the bottom part of the "B" guide relief.

The 10¢ Plate 1 – An Oddity

On the face of it, the pattern of guide dots on the 10¢ plate 1, a 3-relief plate, do not appear similar to any of the other 3-relief plates (see Figure 38, showing guide dots in the lower left corner), but the reason is simple – the transfer roll was flipped around and used in an

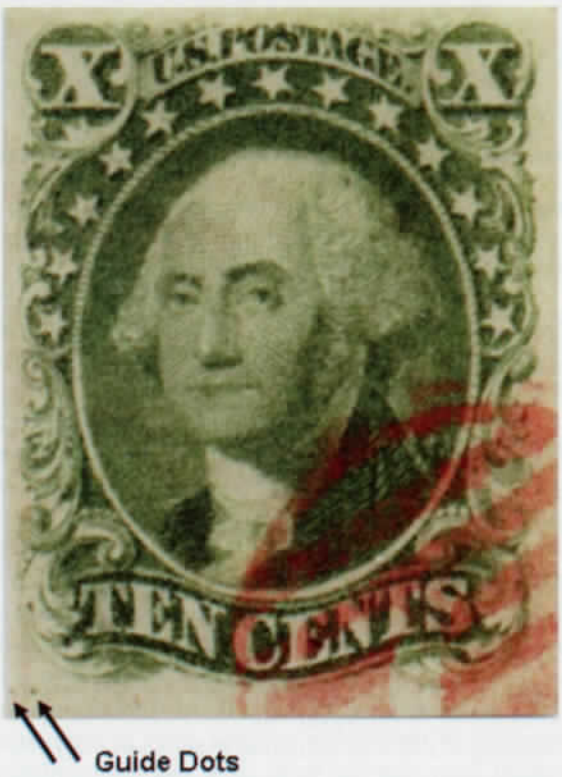

Figure 38. 10¢ type I stamp from the bottom row showing guide dots in lower left corner. If the stamp is viewed upside down, the guide dots fit the top row dot pattern shown in Figure 22. The reason there is a second dot is unknown.

inverted position. In this way, the bottom of the third relief on the transfer roll was the first thing put on the plate, and not the top of the first relief as was done on all other plates. If this plate is viewed rotated 180°, with upside-down stamps, the guide dot pattern matches the other 3-relief plates precisely.

This plate was made in 1855. It seems probable that TCC&Co flipped the transfer roll to protect the bottom "full shells" of the Type I "C" relief based on their experience with the bottom of the Type I 1¢ design.[45] This inversion would mean that the full shells were the *first* thing transferred to the plate, and they would not risk damage by being guided into.[46] In addition, the full shells being at the top of the first relief meant that they would only be used when entering the "top row," and never for the rest of each column, where they would be subject to ironing-out (see Figure 22).

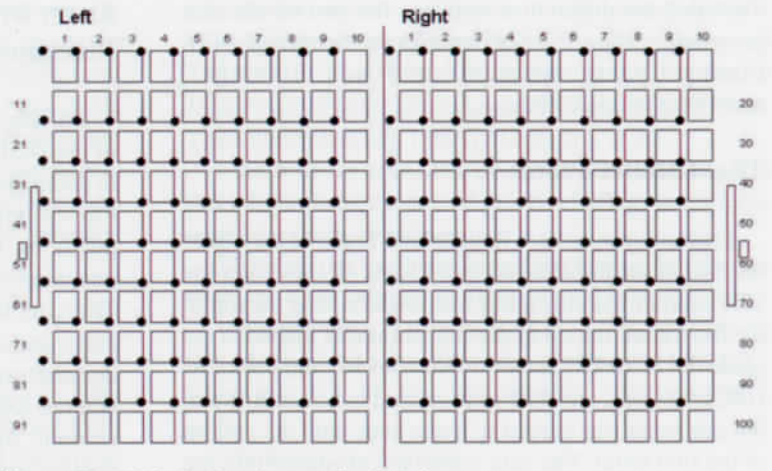

Figure 39. Guide dot locations on 2-relief plate

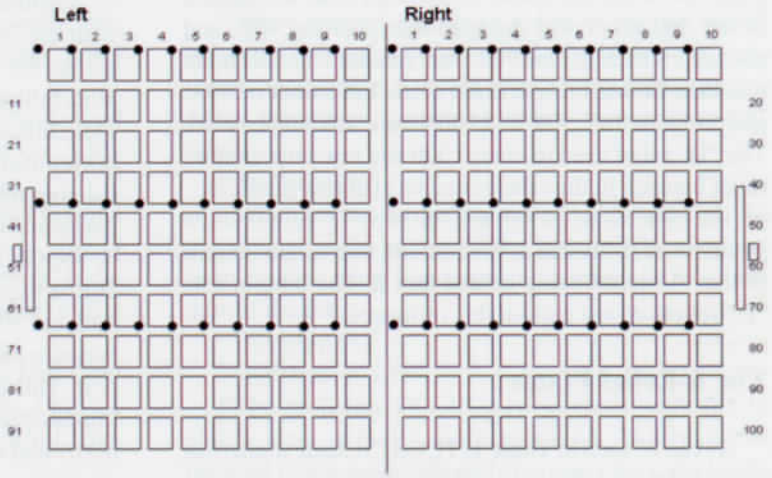

Figure 40. Guide dot locations on 4-relief plate

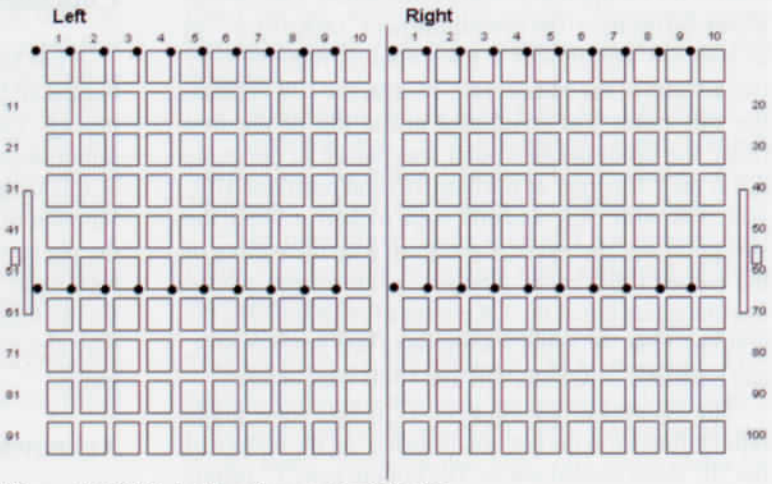

Figure 41. Guide dot locations on 6-relief plate

The 2-Relief Plate

TCC&Co appears to have made only one plate from a 2-relief roller, the 12¢ plate 1 (see Figure 39).[47] Each column required 9 separate settings of the transfer roll. To enter the 10R column, the side point was positioned at the top of the first relief as in Figure 21, the tip of the side point was placed in the guide dot at the UR corner of position 9R, and positions 10R and 20R were rocked in. Next, the side point was moved so it was even with the bottom of the first relief as in Figure 24. The side point tip was placed into the guide dot at the LR corner of position 19R, the bottom of the first relief was dropped into the bottom of position 20R, and position 30R was entered. Positions 40R through 100R were entered by repeating this step seven additional times.

With only two reliefs, there was no need for a 10th row adjustment – the upper (guide) relief went into the 9th row, and there was nothing beneath the lower relief to cause an 11th row partial entry.

This understanding of how the first 12¢ plate was made allows us to settle the long-standing debate over whether it was made with a 1-relief or a 2-relief transfer roll. The top row stamps were entered with a different relief than the balance of the plate, and James Allen has

identified the differences between the two reliefs. See his article, "The 1851 12¢ Imperforate (Scott U.S. #17): Plating Update and Additional New Findings," elsewhere in this volume.

The 4-Relief Plates

Each column in the 4-Relief plates required only three settings of the transfer roll (see Figure 40). To enter the 10R column, the side point was positioned at the top of the first relief, the tip of the side point was placed in the guide dot at the UR corner of position 9R, and positions 10R, 20R, 30R, and 40R were rocked in as a unit. Next, the side point was moved so it was even with the bottom of the first relief. The side point tip was placed into the guide dot at the LR corner of position 39R, the bottom of the first relief was dropped into position 40R, and positions 50R, 60R, and 70R were entered. The side point was then fit into the guide dot at the LR corner of 69R, and positions 80R, 90R, and 100R were similarly entered. The "D" relief used to enter 100R did not have another relief beneath it, thus there was no 11th row problem.

The bottoms of the 4th and 7th row "D" reliefs show guide relief influence at the bottom, due to the bottom of the "A" relief being guided into it. The bottom row "D" reliefs do not exhibit this influence.[48]

The 6-Relief Plates

As can be seen in **Table 1**, TCC&Co made numerous 6-relief plates (see Figure 41). These plates were primarily created for stamps that would be perforated. The 6-relief plates *did* need a "10th row adjustment" (actually a "7th to 10th row adjustment"). Each column required only two settings of the transfer roll. To enter the 10R column, the side point was positioned at the top of the first relief, the tip of the side point was placed in the guide dot at the UR corner of position 9R, and positions 10R, 20R, 30R, 40R, 50R and 60R were rocked in. Next, the side point was moved so it was even with the bottom of the *second* ("B") relief. The side point tip was placed into the guide dot at the LR corner of position 59R, the bottom of the "B" relief was dropped into position 60R, and positions 70R, 80R, 90R and 100R were entered.

The bottoms of the 6th row "F" reliefs show guide relief influence at the bottom, from having the bottom of the "B" relief guided into it. The bottom row "F" reliefs do not exhibit this influence.[49]

Entry by Vertical Columns Dictated by the Placement of the Guide Dots

At one time, plating enthusiasts and other students of the 1851 issues argued whether plate entry was done in complete vertical columns or horizontally row by row. For example, the theory was proposed that after positions 10R, 20R and 30R were entered, the next positions entered were positions 9R, 19R and 29R, etc. The conclusion they generally reached was vertical entry, and our findings show that is correct. As we have demonstrated, all 10 stamps in a vertical column were entered top-to-bottom before starting to enter the next column. Actually, the placement of the interior guide dots *prevented* any direction of entry other than vertical.

Assume, for a moment, that the plate was entered with the 3-relief transfer roll by moving horizontally across the top of the plate (*e.g.*, positions 10R, 20R, 30R, followed by positions 9R, 19R, 29R, positions 8R, 18R, 28R, etc.) instead of vertically. After the first three horizontal rows had been completely entered, the siderographer would have next entered the 4th and 5th horizontal rows, 40R and 50R, 39R and 49R, etc. As can be seen in Figure 22, the guide dot in the LR corner of 29R is used to position the transfer roll for the entry of 40R and 50R. However, *this dot would now be obscured because position 29 had already been entered on top of it.* This proves conclusively that it would have been impossible for the order of entry to have been in a horizontal direction.[50]

Conclusion

It has been more than 60 years since Elliott Perry published his explanation of the guide reliefing process, but few students have realized its importance. The lack of comprehensive examination of this technique, a lack of understanding of the function of the guide dots, and an unfamiliarity with the phenomenon of ironing-out has allowed certain myths and mysteries about the 1851 issue to remain far too long. The authors hope that this article will play a part in the better understanding of the 1851-57 issues.

Acknowledgments

The authors wish to acknowledge Keiji "KG" Taira for all his contributions in the area of guide reliefing. It is through many hours of conversations with him that we have come to finally write this article. Nathan Shmalo

and Mark Rogers deserve sole credit (and gratitude) for discovering the guide reliefing effects seen on the 1¢ stamp. We sincerely hope that Nathan's use of the term "dingle" will endure as the accepted term for this guide relief influence. We are grateful to Wilson Hulme and Roy Weber who provided generous editorial assistance. Finally, we must thank the many students, scholars and authors (too numerous to mention) who have preceded us.

Endnotes:

[1]James H. Baxter, *Printing Postage Stamps by Line Engraving*, reprint of original volume published 1939 by the American Philatelic Society (Lawrence, Massachusetts: Quarterman Publications, 1981) [141 pp., illus.]; L.N. Williams, *Fundamentals of Philately*, rev. ed. (State College, PA: American Philatelic Society, 1990) [880 pp., illus.]

[2]John N. Luff, *The Postage Stamps of the United States* (New York: The Scott Stamp & Coin Co., Ltd., 1902), p. 65.

[3]Elliott Perry, *Pat Paragraphs*, reprint ed. (Takoma Park, MD:Bureau Issues Association., Inc., 1981) [xvi+648 pp, illus.], pp. 76-80. "Guide Reliefing" is the use of an extra relief on a transfer roll to "guide into" a previous entry on a plate.

[4]Stanley B. Ashbrook, *The United States One Cent Stamp of 1851-57* (New York: H.L. Lindquist, 1938), 2 vols.[I, xiii+324 pp., illus.; II, xv+368 pp., illus.], Vol. I, pp. 21-28.

[5]Figure 4 shows an early transfer press where the hand lever forces the beam to move back and forth on top of the transfer roll, thereby rotating it. Figure 5 shows another early transfer press where the transfer roll is turned, thereby forcing the plate to move back and forth. Figures 6, 7 and 8 show a later design where the siderographer turns the large wheel, forcing the plate to slide back and forth and thereby rotating the transfer roll.

[6]W.L. Ormsby *A Description of the Present System of Bank Note Engraving, Showing its Tendency to Facilitate Counterfeiting: To Which is Added a New Method of Constructing Bank Notes to Prevent Forgery* (New York: W.L. Ormsby; London: Willoughby, 1852) [viii, 101 p., [12] leaves of plates : illus.]

[7]Baxter, p. 55.

[8]*Ibid.*, p. 52. Indeed, modern postage stamps printed using the intaglio process are invariably produced using a single relief transfer roll.

[9]Mortimer L. Neinken, *The United States One Cent Stamp of 1851 to 1861* ([United States: U.S. Philatelic Classics Society, Inc., 1972) [xix+552 pp., illus.], pp. 167-168; Neinken, *The United States Ten Cent Stamps of 1855-1859: The Plate Reconstructions, Some Postal History and Postal Markings of the Stamps* (New York: The Collectors Club, 1960) [252 p., ill.], p. 30.

[10]As will be seen, the good vertical spacing is a serendipitous *byproduct* of guide reliefing, but not the *cause* for guide reliefing.

[11]Ironing out has been suggested before, but no one seems to have grasped its fundamental importance.

[12]Elliott Perry, "Discovery of the Guide Reliefs on the Multiple Relief Transfer Rolls of 1851-60," *Chronicle*, Vol. 17, No. 3 (Whole No. 50)(June 1965), p. 99.

[13]Williams, pp. 225-226

[14]Baxter, pp. 60-61.

[15]Perry named the extra relief a "guide"relief, believing its purpose was to guide the transfer roll into the proper position. It would seem a more accurate name might have been something like a "non-ironing-out" relief.

[16]Baxter, p. 52.

[17]When taking up the second relief on the roll, the raised lines at the bottom of the first relief would have been crushed when they came in contact with the blank part of the die.

[18]Baxter, p. 52.

[19]Williams, p. 216.

[20]The problems TCC&Co encountered with the 1¢ stamp were actually more involved. The reader is referred to the Ashbrook and Neinken One Cent books for further information. Ashbrook, pp. 87-88, Neinken, *One Cent*, pp. 43-44 and the article *"Reexamining the Origin of Plate 1 of the 1¢ Stamp of 1851"* in this volume.

[21]For instance, the 1¢ plate 4 and the 10¢ plate 1.

[22]Ashbrook, Vol. I, p. 233; Eugene C. Reed, "Toppan Carpenter: Another Chapter," *Collectors Club Philatelist*, Vol. 67, No. 5 (Sept-Oct 1988), p. 304.

[23]The other three frame lines did not transfer well either (but not due to ironing out), and most of them were also recut.

[24]Elliott Perry, *United States 1857-1860 Issue*, Mekeel Booklet #39 (Beverly, MA; Portland, ME: Severn-Wylie-Jewett Co., [19—]) [63 pp., illus.]; Perry, *Pat Paragraphs* #35, pp. 76-80, Perry, *Chronicle* 50, pp. 97-99, Perry, "Relief-Roller Entry on Certain Plates for 1851-Issue Stamps," *Chronicle*, Vol. 18, No. 3 (Whole No. 53)(October 1966), pp. 120-121, Perry, "Guide Relief Process for Manufacture of 1851-'60 Plates," *Chronicle*, Vol. 20, No. 4 (Whole No. 60)(November 1968), pp. 126-128.

[25]Ashbrook correctly describes which dot controlled which stamp entries on p. 111 of his 1¢ book. However, in the very next paragraph, he proposed other possibilities to explain Plate 1 Early of the 1¢. See the article "*Reexamining the Origin of Plate 1 of the 1¢ Stamp of 1851*" in this volume for a more complete discussion.

[26]There is documentary evidence that plate 6 of the 1¢ and plate 2 of the 12¢ were made, but as no stamps have ever been identified from these plates, they have been omitted from the summary.

[27]The last five plates made by TCC&Co, namely the 1¢ plates 11 and 12, the 12¢ plate 3, the 30¢ plate 1 and the 90¢ plate 1, are exceptions. These plates, made beginning mid-1860, have the second type of imprint reading "Toppan Carpenter & Co. Philadelphia" (TC&Co) and were made using somewhat different methods. Neinken, *One Cent*, pp. 478-79. TC&Co's non-stamp business merged with six other banknote companies on May 1, 1858 to form the American Bank Note Company, and it may be the stamp plate transferring operation had been phased out by mid-1860. The presence of the "secret mark" on the 1¢ plate 11 and 12 stamps (see Neinken, *One Cent*, p. 469) suggests the original die had left the possession of TC&Co, so perhaps the manufacture of these five plates was contracted out to another engraving firm.

[28]The 12¢ plate 3 appears to have been made from a 2-relief roll, but using a somewhat different procedure. This issue is under study at the present time.

[29]The Franklin Carrier plate is a "mirror image" of the other 3-relief plates.

[30]Baxter, p. 52.

[31]If this guide was not properly adjusted parallel with the side of the transfer roll, a vertical column of entries can be out of alignment. The ninth vertical column of the left pane of plate 3 of the 3¢ stamp ("the three rows") is probably the best example of this to be found on the TCC&Co plates.

[32]Baxter, p. 59.

[33]Standard plate notation used by philatelists gives the position followed by the "pane" of the plate. (Every TCC&Co plate had two panes of 100, left and right). Positions 10, 20 and 30 of the right pane of the plate are denoted as "10R," "20R" and "30R" and are the top three stamps in the right-hand vertical column. For a complete designation, the position is followed by the plate number. If the plate has an early, intermediate and/or late state, the state is denoted last. For example, position 10 of the right pane of plate 1 in its early state is denoted as 10R1E.

[34]Baxter, *op cit.*, p. 49.

[35]The designs here are actually being transferred to the lower right corner of the plate in an inverted position. It is simpler to understand the process if we rotate everything 180° and assume that the siderographer starts in the upper left corner of the plate (with right-side up designs) and works downward. Stamps printed from the upper left corner of the plate are those in the upper right corner of the printed sheets. We will describe the plate-making process from the viewpoint of the printed stamps rather than the siderographer's orientation to the plate.

[36]Williams, pp. 221-22.

[37]See the authors' "A Detailed Study of the 3¢ 1851 Relief Characteristics" in this volume for a very detailed description of guide relief influence on the 3¢ stamps.

[38]It appears that sometimes the over-rocking went at least halfway up into the previous entry. As Perry noted, the "gash on shoulder" from the "C" guide relief was occasionally imparted into a former "B" relief. This issue is covered in depth in the authors' "A Detailed Study of the 3¢ 1851 Relief Characteristics" in this volume.

[39]This variety, caused by forgetting the 10th row adjustment, occurred when plate 11 was reentered in 1858, and not when the plate was first made in 1857. The cause was still the same.

[40]Plate 1 of the 10¢ was entered "upside down" by flipping or inverting the transfer roll. This plate also required an adjustment when making the last entry in a column, (*i.e.*, any position in the top row). Interestingly, when this plate was made in the spring of 1855, TCC&Co neglected to make the "1st row adjustment" when entering first two columns (1L1 and 2L1 are from the middle relief on the roll).

[41]*The Carrier*, private newsletter by Mark D. Rogers, November 1994, p. 3.

[42]Neinken, *One Cent*, pp. 181-85.

[43]Ashbrook, Vol. I, p. 202 (and repeated by Neinken, *One Cent*, p. 184).

[44]Neinken, *One Cent*, pp. 424-25.

[45]Baxter, p. 49.

[46]The Neinken 10¢ book had it almost right in the diagram on page 31. However, the diagram shows 18 of the 20 Type I "C" reliefs pointing to the wrong guide dots.

[47]Plate 3 of the 12¢, apparently made in 1860, appears to have been made using a 2-relief transfer roll, as previously mentioned.

[48]Perry, *Pat Paragraphs*, p. 77.

[49]Perry, *Pat Paragraphs*, p. 79.

[50]There are many "footprints" on the stamps that provide clues to the order of entry. Perhaps the best-known examples are the shoulder curls on plate 7 of the 1¢ stamp. Neinken, *One Cent*, pp. 366-70.