The 1597 Tongs

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The image in figure 1 shows a blacksmith forging nails. It dates back to 1597! The tongs in the image, as shown in the close-up of figure 2 are intriguing to me. They look somewhat like a duck bill. Looking around the picture, it looks like the blacksmith had just two pairs of tongs. It stands to reason that those tongs should be well thought out and useful. To find out, I decided to build a pair and give them a try.

Figure 1: Ignis (Fire) by Nicolaes Jansz Clock. 1597. In the public domain. Made available by the Rijksmuseum, Amsterdam, Netherlands.

As the close-up in figure 2 shows, the two bits are quite different. The tip of the top bit ends up flat and fairly wide, as shown in the top of figure 3. The bottom bit, on the other hand, comes to a rather narrow end, as shown in the top of figure 4. When looked at head-on, the bit ends look like a stylized duck bill. While not obvious from the image, I suspect that the top bit is slightly cupped. I imaging that the bottom bit is slightly rounded over. This will create three contact points: the two edges of the top bit and centered between them, the bottom bit. Arranged in this fashion, the three contact points should offer a lot of holding power, certainly more than flat-bit tongs.

Before going into the details of building the tongs, let's turn our attention to the ends of the reigns. Consider figure 2. You will notice that the top arm is shorter than the one at the bottom. Additionally, the bottom arm terminates with a nice bend. It is somewhat unusual to have one arm shorter than the other. Upon closer inspection of the image, it appears that the end of the top arm simply broke off. The artist did not draw them nicely rounded over, rather there seems to be a fairly sharp, angled end to them. Studying the image, I found the pose struck by the smith to be very unusual. He seems to be squatting down to a certain degree. Depending on how you look at the image, the tongs seem to rest on his upper left leg. Certainly, this would be not necessary from a perspective of exerting sufficient force to hold a small piece of steel.

Figure 2: Close-up of tongs.

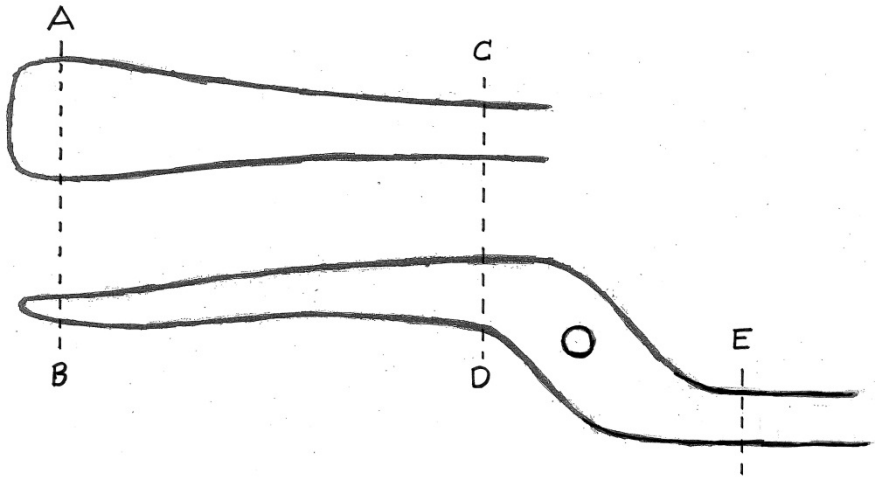

Figure 3: Profile and birds-eye view of top bit

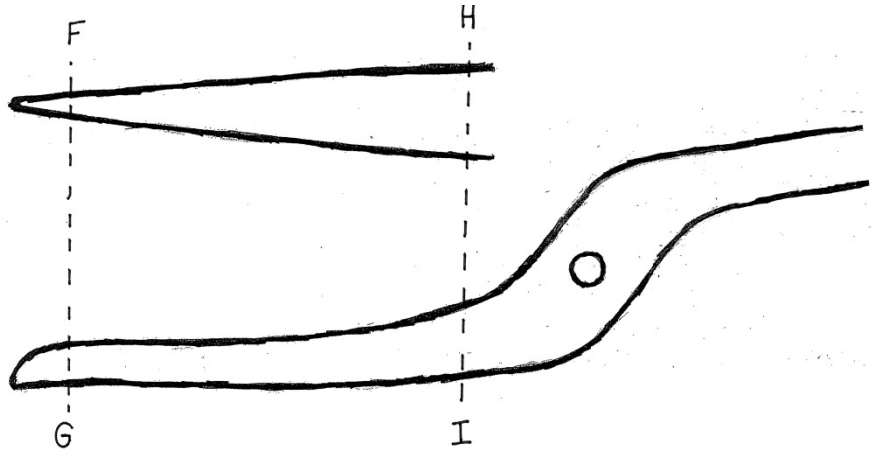

Figure 4: Profile and birds-eye view of bottom bit.

The remainder of this article contains construction notes on building these tongs as well as an evaluation of their use. I built a prototype from ½” square 1045 medium carbon steel. When it comes to the overall length, I used the width of the blacksmith’s wrist as a guide. Measuring the wrists of some of my burlier friends, I determined them to be about 4 ¼” wide. Based on my calculations, this makes the tongs about 23” long. The bits are 5 ½” long, as measured from the center of the rivet hole. These dimensions are too large for me, as such I built tongs that are just 21” long and for which the bits are just 4 ½” long.

Top Bit. In the bottom of figure 3, you will notice that the tip of the top bit is gently bent upwards. There is a corresponding bend in the lower bit, as shown in the bottom of figure 4. Together, they ensure a three point contact area for a reasonable range of thickness of the materials to be held. The width of the top bit at (A) is 7/8” and it’s thickness at (B) is about 3/16”. The width at (C) is 7/16 and the

thickness at (D) is 3/8”. The reigns at (E) are ½” thick and 3/8” wide. They gradually taper to 3/8” thick and 5/16” wide just before the ears at the end of the reigns.

Bottom Bit. In the bottom of figure 4, you will notice that the tip of the bottom bit is rounded over and somewhat angled backwards. I imagine that this aids in picking up steel that is in the fire. This way, the bottom bit will slide underneath the steel, rather than push it further into the fire. When it comes to the width of the bit, as far as I can tell from the image, the bottom bit does narrow at a steady rate and comes to a fairly narrow tip. Additionally, the bottom bit as depicted in figure 2 appears to be slightly shorter than the top bit, by about 3/16”. The width of the bottom bit at (F) is ¼” and the thickness at (G) is 5/16”. The width at (H) is 3/8” and the thickness at (I) is ½”.

General Construction Notes. I began by forming the bits as sketched in figures 3 and 4. In each of the arms, I bent a fairly tight S. Next, I used the pein of my hammer to draw out the S of each arm length-wise, to about ¾” wide and 3/16” thick. This process will also “widen” the S a little bit. The arms are drawn out so as to gradually taper to the desired dimensions. The ears at the end of the reigns are slightly bent outwards. After punching the rivet holes and dry-fitting the tongs to make any last minute adjustments, I filed the contact area of the tongs flat, to facilitate smooth operation of the tongs.

Figure 5: The prototype

Figure 6: The bits

Evaluation. These tongs are best seen as an improved version of flat bit tongs. They do a noticeably better job at holding flat stock and sheet goods than flat bit tongs. The length of the bits reduces the leverage that could be attained. However, it comes in handy when working larger pieces, such as body armor, something a smith during the middle ages would have produced. All in all, these are an improvement over flat bit tongs; however, I would not want to give up my other tongs.