

Custom Castings

After your drawings are complete, a foundry specializing in custom work can do the rest.

By Jon P. McGraw
Alloy Casting Co.

This article originally printed in the 1994 November-December issue of Fabricator Magazine, an official publication of the National Ornamental & Miscellaneous Metals Association.

Once a fabricator provides a dimensional sketch for a custom casting much of the work is already done. From that point the foundry can provide a quote for a turnkey program that includes creating the master pattern, fabricating the tooling, and manufacturing the final product. The only part that should concern the fabricator is the creative concept and creating the sketch.

Like most custom projects, creating the sketch is the easy part. Selling, fabricating, and installing the job are always more involved.

One of the most encompassing projects that Alloy Casting has completed was a custom project for a blacksmith shop in West Palm Beach, Fla. The program included five custom castings of various sizes.

The owner of a Miami Beach, Fla. home was renovating a mansion to its original 1920s design. The source document for the design was a 1920s newspaper article containing a photograph of the house's original exterior. The newspaper photograph was studied and the ornamental iron work was redrawn to a full-scale drawing, which included three of the five custom castings [Figure 1]. The castings were to be used on the exterior of the house as a window dressing and security bars, and in the interior of the house as a room divider.

The sketches were submitted to Alloy Casting for a quote. The quote was for a turnkey project that included five original wood patterns and carvings,

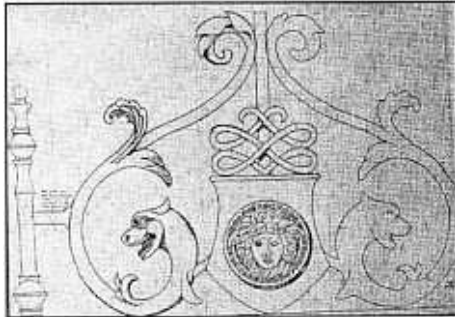


FIGURE 1: The work begins when the dimensional drawing are submitted to the foundry

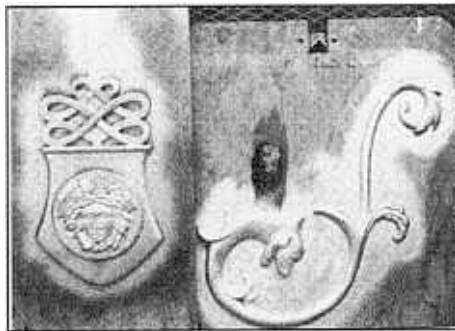


FIGURE 2: The tooling is made for the face and dragon.

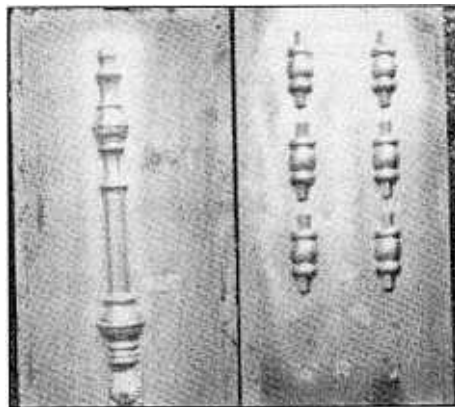


FIGURE 3: These parts will become double faced castings

four pattern boards, eight sets of castings, one 5/8 inch square core box, and a match plate. A match plate is a piece of production tooling that has the design of the casting embedded into it. When the foundry's sand is pressed against the design an imprint is left in the sand. It is this imprint that gives the aluminum casting its artistic shape. The core box enables the foundry to make and bake hard sand pieces. These hard sand pieces (called "cores") are then placed in the mold to block out areas of the casting where horizontal holes are needed.

The wood-carver began the project by carving the plaque face and the carved dragons. The full-sized drawing enabled the woodcarver to carve with confidence knowing that there would be no pattern modifications. The master patterns for the round collar (5/8 inch square hole) was created by a pattern maker and given to a match plate fabricator to make the production tooling.

The first phase of the project included only eight sets of castings. With such a small number of castings, four of the five original master patterns were mounted directly on wooden boards to save tooling expenses. Because the dragon faced both left and right, it was tooled to be double-faced. This allowed the same dragon to be used for both left and right applications. The collars and balusters were also double-faced. The face plaque was constructed on a single face pattern board in order to save carving duplication and expense. During the second phase

of the project, two single face plaques were placed back-to-back to create a two-sided design.

Figure 2 shows the tooling that evolved from the original carvings. The dragon is double faced and the sun faced plaque is flat black/ Figure 3 shows the tall baluster and the round collars that were lathe turned and mounted to wood pattern boards to provide a double face casting. Figure 4 shows the

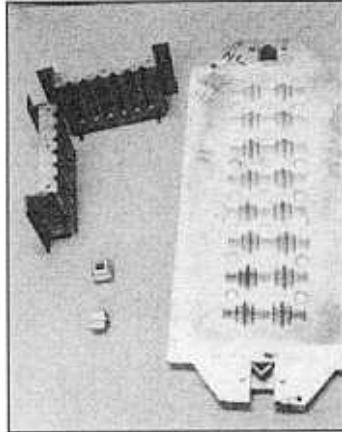


FIGURE 4: These collars are shown along there match plate and core box.

square collar, its match plate, and the 5/8 inch core box. The square core print on the tooling enabled a 5/8 inch sand core to be cast into the casting. When the core was removed, the result was a 5/8 inch square hole. The collar could then be slipped on to a 5/8 inch square bar. Figure 5 shows the castings arranged per the original sketch and Figure 6 shows the actual installation on the Miami Beach home.

A custom project for one item typically takes from start of master pattern work to prototype casting about four to six weeks. The exact time depends on the intricacy of the master pattern carving. In the Miami Beach project, it took seven weeks to complete the five original casting designs.

A foundry is organized to handle custom projects. Wood carvers and pattern makers are trained to provide sufficient drafts to eliminate undercuts and to compensate for metal shrinkage/ Foundries that handle all stages of custom casting production in-house, such as Alloy Casting, insure high quality tooling and prompt deliveries. Figure 6 shows the wood-carver working on a new pattern, while figure 7 shows Doug Thomas [left] examining the master with Juan Acosta, the match plate maker.

Most projects received by Alloy Casting are initiated by a fabricator with a sketch. When a sketch is used, the foundry quotes from this drawing after acceptance. The foundry then handles the project on a turnkey basis from master pattern through tooling fabrications, to final castings.

This article is the third in a series on custom castings. Earlier articles covered technical details (May/June 1987) and economics of master patterns and tooling (November/December 1992). Alloy Casting Co. has been a NOMMA nationwide supplier member since 1974.

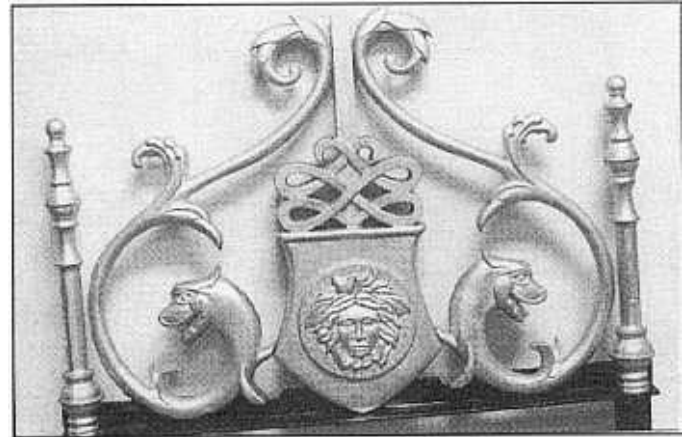


FIGURE 5: The castings are arranged per the original sketch.

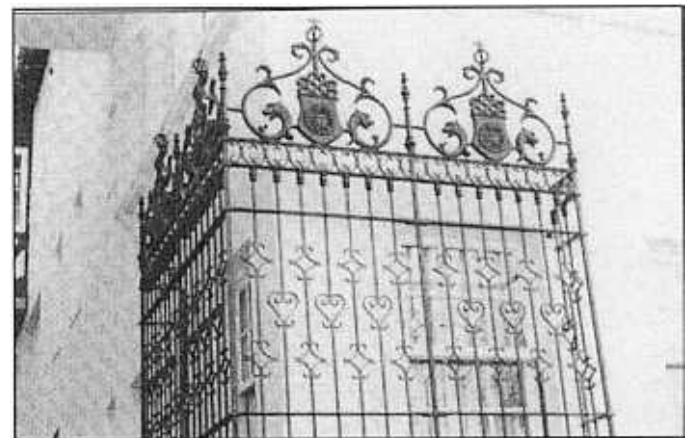


FIGURE 6: The final product is installed in Miami Beach.



FIGURE 7: The wood carver creates a new master pattern. A good pattern design will compensate for metal shrinkage.



FIGURE 8: *The carver and match plate maker examine a master.*

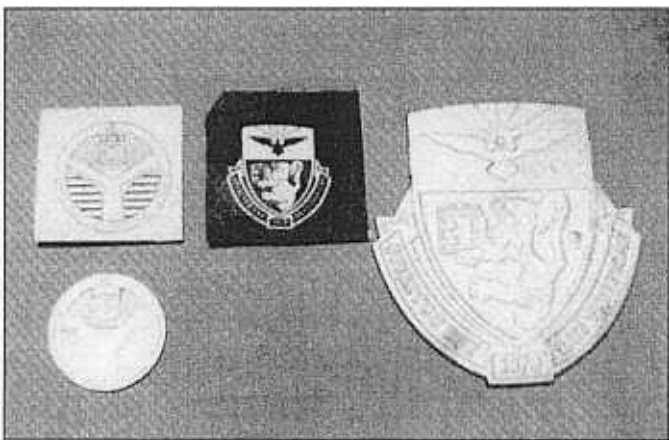


FIGURE 9: *Both of these plaques are shown with their original sketches. The casting at the left is a full sized drawing for a bench end insert. At right, a 40 percent scale drawing was carved to actual size by the wood carver.*

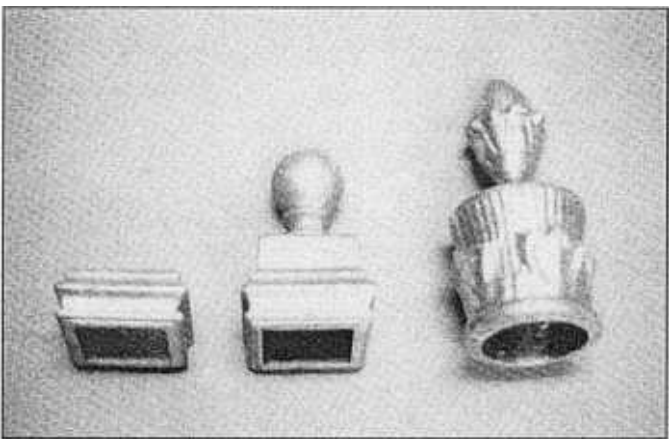


FIGURE 10: *These two types of tops were created from two separate castings. The combination of two individual parts into one casting reduced fabrication costs. The item on the left is shown with matching floor flange. The left ball top is a combination decorative flange and a standard two inch ball top. The casting on the right combines a crown and a two-piece collar to form a single piece top.*