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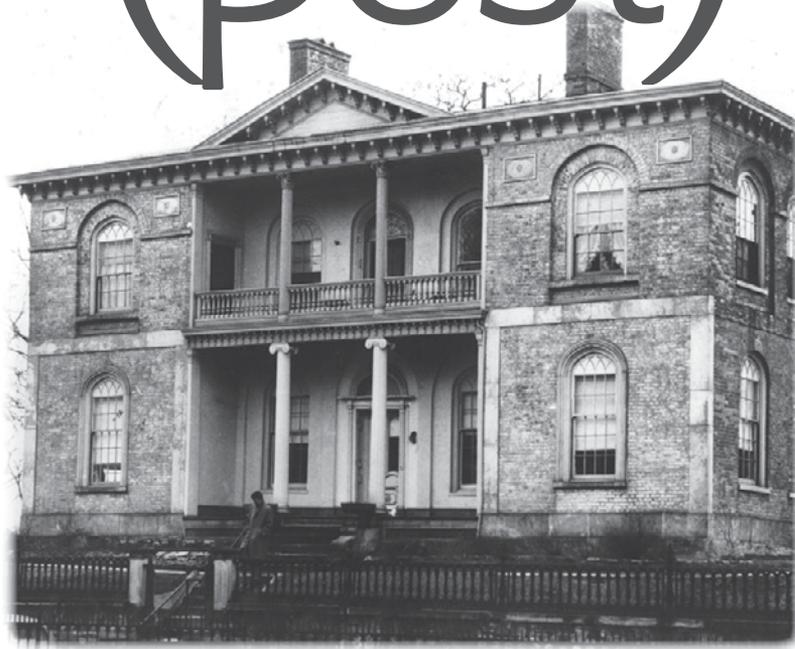
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This old fence (post)



- Determination helps Elegant Iron overcome awkward fabricating techniques to preserve historic fence and win Top Job award.

By Patrick Dalton



Carneal house fence after restoration, above. Note the replaced finial missing from the older photographs and the banner for one of the renovations many awards.

Carneal House circa 1940 with original fence, opposite page. An additional 150 linear feet was recast to accommodate the home's recent renovation and landscape expansion. *Below*, the fence style was originally designed and cast in the 1850s and was no longer in production. In this photo finials were already missing from atop fence posts.



My company,

Elegant Iron Studios, W. Alexandria, OH, was honored to win the 2010 Silver Top Job award for historic restoration.

We are a first-year NOMMA member, but have enjoyed *Fabricator* magazine and observed the organization for years. We look to many of our fellow members as sources of knowledge and inspiration.

The success of our award-winning restoration project stems more from determination and our willingness to have custom castings reproduced than from artistic inspiration.

More importantly, custom castings can be a good source for profit and will have the side benefit of increasing both your knowledge and reputation.

In this article, I will explain the process we used for our project, and the history and technical aspects that lead to the restoration.

Now the city's oldest surviving home, the once grand structure had been empty for years and was, literally, falling down around itself.

Typical of its riverfront location, the home was built on a hill and surrounded by an ornate cast iron fence atop a five-foot limestone retaining wall.

Large portion of fence missing and broken

Only about half of the original fence remained. Some sections were missing entirely while others had broken castings. The construction of the fence itself was interesting to me while somewhat awkward.

The cast posts had five parts:

- 1) a base,
- 2) main body,
- 3) decorative ring,
- 4) cap, and
- 5) acorn finial on a threaded rod.

In spring 2009, a general contractor who had renovated the historically significant Carneal House in Covington, KY, approached us.

One of the founders of Covington, Thomas Carneal, built the circa-1815 home.

In concept, the house is Georgian and highly influenced by the great Italian architect Andrea Palladio.

William Wright Southgate purchased the house around 1835 and added a large rear wing.

They had been designed to stack over a solid steel post and then to be held in place by the tension created by threading the finial into a tapped hole in the top of the post. Each individual cast panel was fairly large with eight panels creating a repeating pattern through each fence section.

The pattern itself was single-faced, side backed-out, and created a continuous pattern of interlocking arches with a star detail and a denser bottom band of similar arched shapes.

The individual castings had pins on the top and bottom and were sandwiched between a solid flat bar on top and angle iron on the bottom. The top rail and bottom angle had rods protruding from each end that inserted into holes in the base and top of the cast post.



The original castings next to the new modified castings ready to be recast.

Some debate exists about the age of the Carneal house fence. While the main house was built in 1815 and the rear wing added in 1835, some local historians date the fence closer to 1860. A local author noted in 1851 that the popularity of iron fence and railing increased substantially in the previous decade, having been no local railing manufacturers in 1840 but no fewer than five shops with 77 employees by 1850. This seems to correspond with

the Victorian tendency to decorate older Federalist or Georgian-style homes with somewhat contradictory lavish cast iron designs.

Winning the job

I remember seeing the business cards of many competitors arrayed in the project manager's office. Every fabricator and fencer in our area had

been called to the job site. All had the same story: The casting and the posts are unavailable.

To complicate matters, the renovation called for cutting garages into the hillside and connecting them underground to the original structure. This meant that in addition to the missing fence, they would need the fence made for the new angled limestone retaining walls. The property owners, architect, and contractor were resigned to replace the missing fence with a mismatched design.

For many of us, the idea that our work will outlive us provides motivation. When I see historic ironwork, I imagine the people who created it, and I feel an obligation to help their legacy endure. A contemporary fence for this property was simply not an option.

My proposal:

- Recast the fence pattern.
- Duplicate the posts throughout.
- Create two new castings to match the slope of the retaining walls.

I got the job.

For this project, I submitted quote requests to many foundries. Only a few could accommodate large parts, and many were unwilling or unable to create the molds I needed. Two of the domestic foundries had done this regularly, producing some amazing work. Unfortunately, the cost of domestic production of these castings made the cost of the project unworkable.

Rather than abandon the idea, we contacted King Architectural Metals, Dallas, TX, a well-known source of quality cast iron and a developer of unique castings. Using their estab-



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lished foundries was a good fit. I worked with them several years ago on a previous, much smaller casting project for which they reproduced a fan-shaped finial to restore a beautiful iron fence.

Castings creation process

The task of creating the angled castings went from being intuitive to a little frustrating and back again.

At the first look, the job seemed easy. We removed the right and left part of the top arch and tilted the lower part by lengthening and shortening the legs of the design.

While we sacrificed the continuity of the top, we maintained it at the bottom.

Understanding that we didn't need strength in the casting itself, we made the lengthened base and caps from 1/8-



The new garage required the angled castings. The new sections and retaining walls blended seamlessly with the original wall and fence.

inch sheet metal, which preserved the look of the backed-out side.

The welding was done standard MIG with some TIG wash and grinding/polishing to remove porosity. Likewise, the jagged holes in the post were filled with a slug from our press and TIG welded with silicone-bronze. Even though the weld was not textbook, without pre-heating or nickel-filler material, the casting was strong.

The ordering and casting process was straightforward. I first documented the dimensions and took photographs of all the parts. When doing a custom cast project, include a tape measure in the shots to help answer questions that may arise and smooth potential slow-downs for your vendor. Also, be sure to weigh the castings. While the charges for molds and determining if a foundry can accom-

modate the part is based on dimension, the actual cost is typically based on weight. You will need this information at the beginning of the process.

Any fabricator should expect a lengthy turnaround time. Get a timeframe from your vendor, but expect to wait several months or more for the castings. The production for our castings took about four-and-half months with close management. The tightest possible turnaround for production would likely be three or four months, but it will be problematic and not guaranteed. Many foundries in the U.S. shut down in the summer for a month or longer due to heat. Discuss the process in detail and plan for some delays.

Our project was delayed by standard customs inspections and by a weeklong holiday shutdown at the foundry. So ship your originals as early as possible. We crated and packed ours to be freighted overseas.

The last thing you want is a broken original. We elected to create a detailed photo, annotated to show measurements, quantities, and labels for each part.

Remember, your project may involve many people and language barriers; anything to expedite, simplify, or clarify the project will benefit you.

Challenges

■ **Alignment.** Once the castings arrived in mid-January 2010, layout and fabrication was simple, but became tedious. The castings themselves caused a slowdown. The original castings didn't



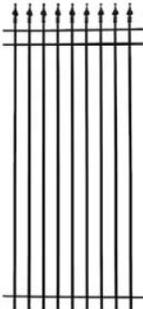
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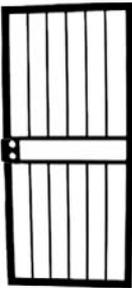
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lay flat on a fab table, and the recast magnified this a little. As we know, "a little" plus "a little" equals "a lot."

We had to grind the back of every casting considerably to get proper alignment. Cast iron is particularly nasty to grind. Our ordinarily tidy shop was covered in mounds of grinding dust everyday.

■ **Section lengths.** Another challenge was the requirement to post in exactly the same locations as the original. This required each section be made to slightly different lengths, which is by no means hard to do, just hard to accept.

The predefined width of each casting meant that any difference in section length was made up by splitting the difference to the post on each end; the sections varied by inches.

Like many of NOMMA's talented members, we are in the fine fit-and-finish business. In fact, the inconsistency bothered me enough to take what difference I could in tiny increments from each casting while still mating them.

The original design also called for each end of the top rail to be thickened to accommodate the pin for the post. We accomplished this by welding ½-inch square to ½-inch round to ½-inch square and welding and grinding the faces smooth.

Only minor installation problems

The installation was straightforward with the only minor difficulty arising from the post location and method of attaching each section. The posts had been leaded in place and cut off or broken at some point so we ended up core drilling a mixture of metals and limestone. We used the original installation method of pinning the sections into the cast posts.

This caused another inconvenience. We were only able to add the pin to one end of each section in shop and had to trim each to fit the "slope" created by the irregular cast posts being tensioned together.

On the sloped retaining wall, we installed the angled sections by cutting the post base to the slope. The finite height of the casting and the increased



Newly recast post and new fence section after installation.

take-out for the height of the top and bottom rail on the angle, thankfully, worked out well.

The castings were ordered prior to the wall being built. The contractor's site manager (who was skilled and a pleasure to work with), our talented lead fabricator, and I determined the eventual slope from a combination of the prints, math, and string on a hillside only partially excavated. Happily, we were within a degree of actual conditions.

I'm very proud to have helped preserve the history of the property and to have been honored with a Top Job Award. The project received other accolades, including awards from the Cincinnati Historic Preservation Society, the city of Covington, and newspaper and Internet articles praising the work.

We pride ourselves on fit-and-finish and technical expertise. To us, an ideal job is one that was measured, fabricated, and executed to perfection. The fact that we had to use awkward fabrication and installation techniques still bothers me a little, but is overshadowed by the recognition from our peers.

Using the techniques and sources I've outlined, I hope that other projects of historic value will be preserved and enhanced by our members and provide another means to increase their own recognition, skills, and profitability. 🌟

For your information

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