

Project Report

Date: 31/08/21
Client: Henry Lamb
Location: Woodfield, Clara, Co. Offaly
Project: Restoration of wrought iron pedestrian gate
Prepared by: Aquilla Cooper

Introduction

The following is write-up of the restoration of a wrought iron pedestrian gate at the above location. There is documentary evidence in the form of a survey map of the house and surrounding lands, dated 1765, which suggests that the gate was originally made in the 1700s. There is no date or other markings on the gate itself, but the style of the forged components and construction methods would support this time period.

The gate has however, been re-hung much more recently; probably due to excessive wear in the original hinges. In this recent re-hanging the top hinge had been crudely made using a large threaded nut, electric welded to a flat bar.

Removal

In order for the gate to be worked on, it was removed and brought to the workshop. Pictures were first taken on site as part of the record of the restoration.



The gate prior to removal.



The corrosion can be clearly seen coming through the paint.



All the fine detail of the finials has been lost, hidden beneath the layers of corrosion and paint.



Poor condition of the top row of finials.



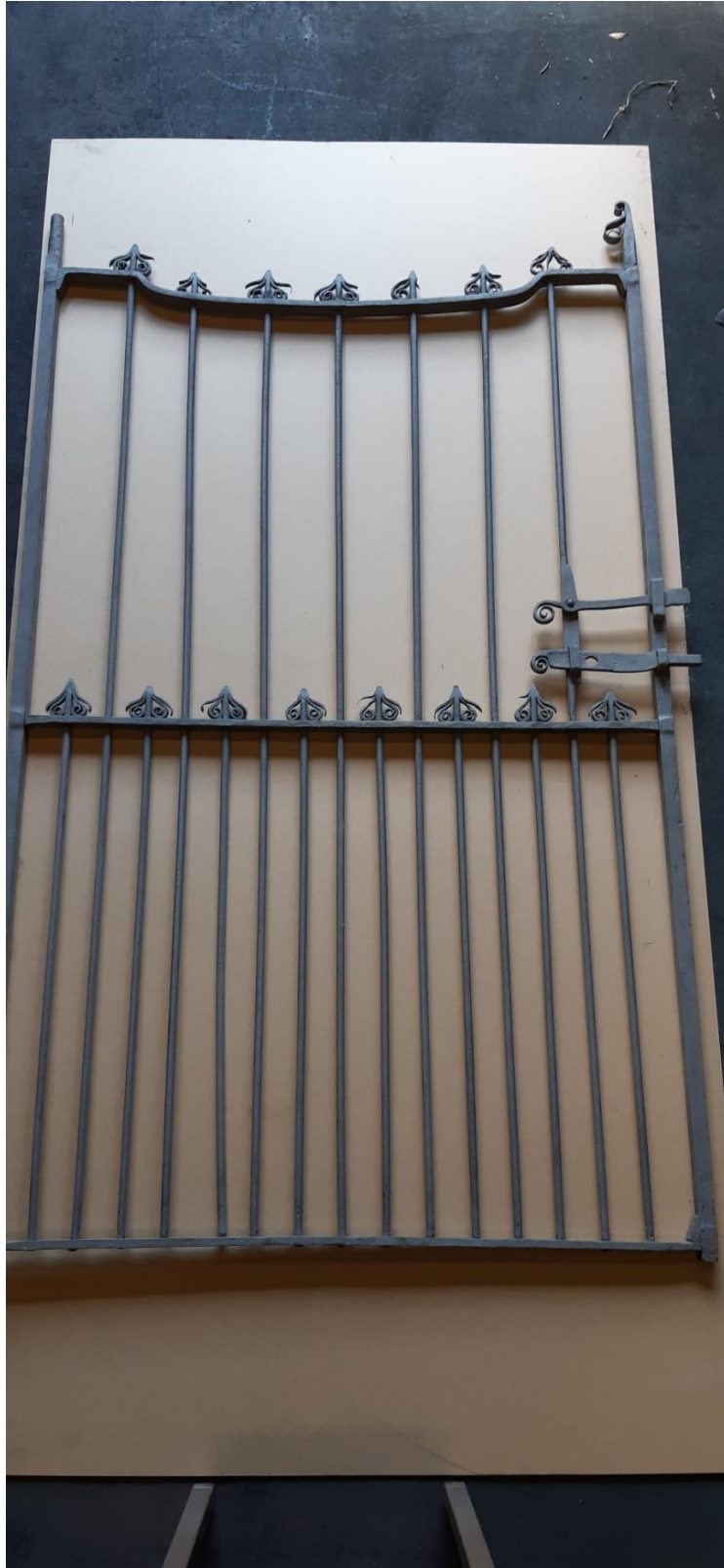
Close up showing the effect of “rust jacking”

The iron rust which forms is 7 times the volume of the original material, so as it forms between the various elements and components they are pushed apart or “jacked”, distorting the shapes of the finials.

This jacking action is strong enough to break joints apart. Luckily this had not happened in the case of this gate.

Shot Blasting

The first step, once the gate has been brought to the workshop, is to gently shot blast. This removes all of the corrosion and old layers of paint. It is only after this that the true condition of the gate can be seen.



The shot blasted gate.

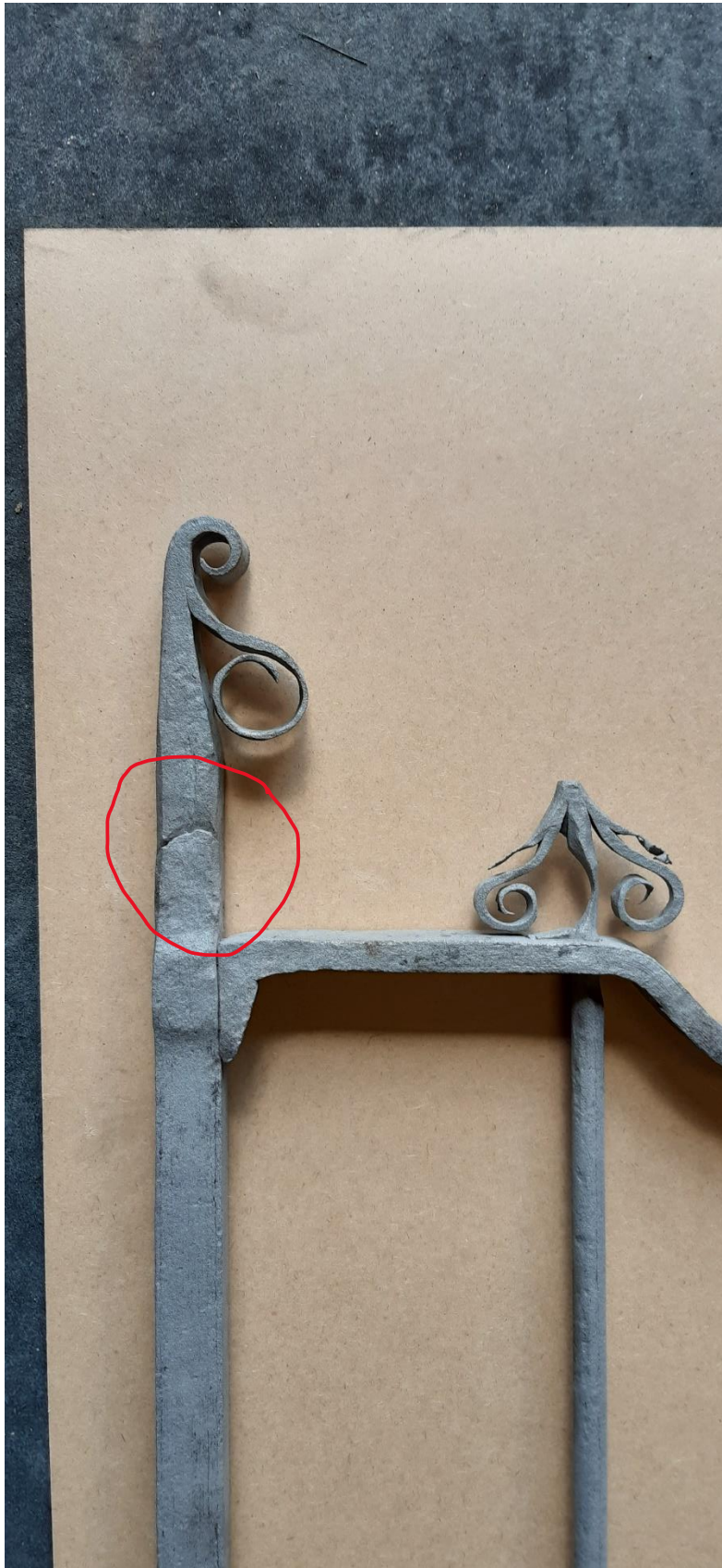


Close up pictures of the top row.

The extent of the corrosion and jacking can really be seen now. Some elements are gone altogether, while others are too badly corroded to save.



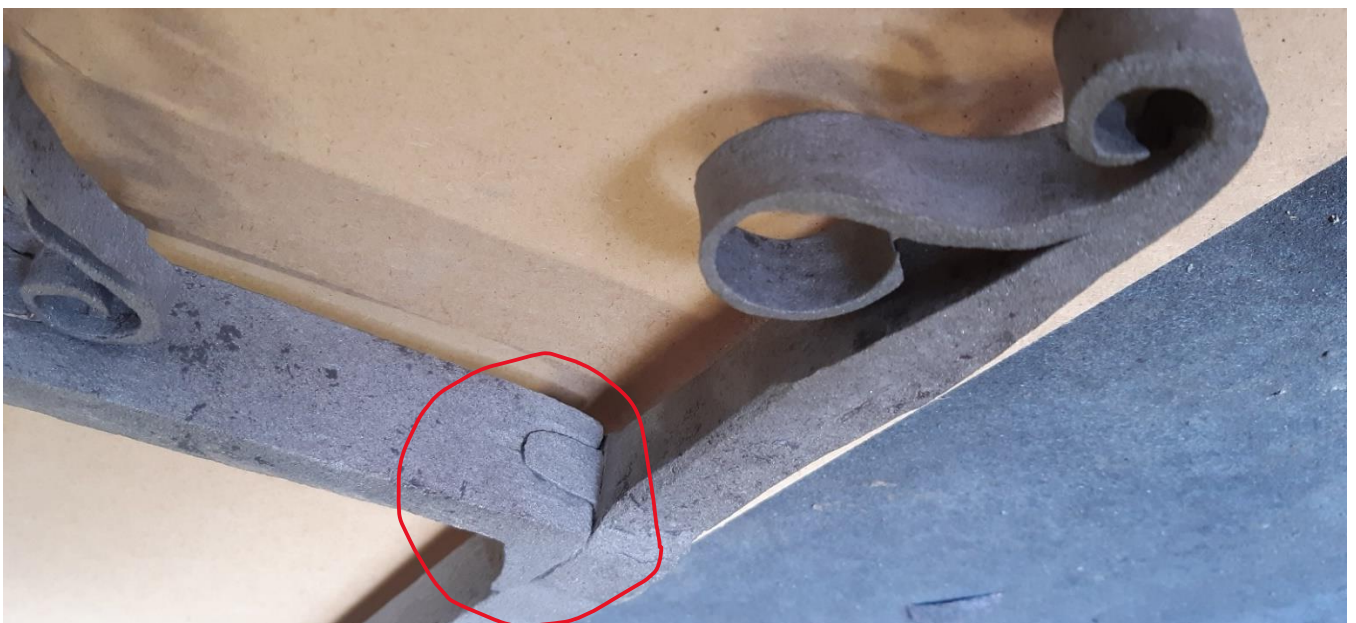
Close up pictures of the middle row.



In this picture you can see the seam where the scrolls on the top of the closing post were fire welded together when the gate was originally made. Before the advent of gas or electric welding the blacksmith would have brought the individual elements up to a white heat in the forge and then stacked them on top of one another on the anvil and hammered them together until they fused. It is often possible to see the seams of fire welds when you know where to look.



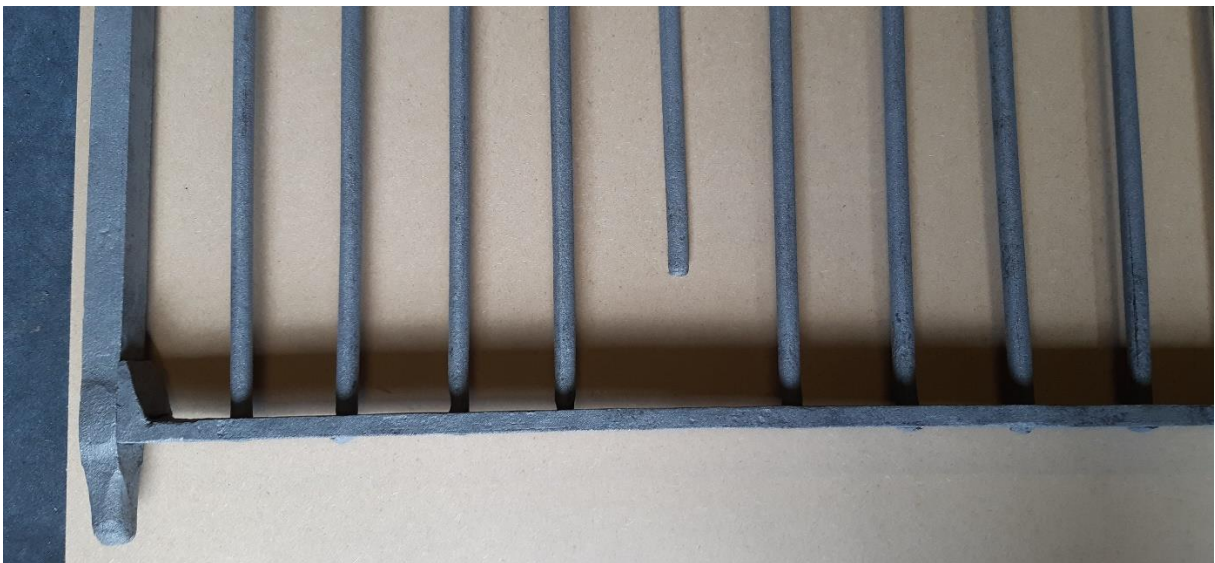
Fire welded gusset



Fire welded tenon



Corrosion thinning on some of the uprights



One of the uprights had a broken tenon

Restoration

After shot blasting the gate is inspected to determine what repairs are to be made. The aim is to retain as much of the original fabric of the gate as possible and only replace elements when absolutely necessary. Here is a list of all the defects which were to be addressed.

Repair list:

- Replace 14 ribbons on finials
- Replace 4 scrolls on finials
- Replace 1 scroll on closing post
- Build up severely thinned ribbons and scrolls by brazing
- Replace worn latch rivet
- Forge new tenon on 1 upright
- Build up wear on bottom hinge with weathering steel
- Build up corrosion thinning on several uprights using weathering steel
- Make new bottom hinge cup
- Make new top hinge eye bolt hanger

All new components were forged from wrought iron.

All new components were attached by gas brazing.

Where welding was necessary, weathering steel was used, which is the accepted filler material to use when welding wrought iron.



New ribbons forged from wrought iron



Stages in forging the scrolls



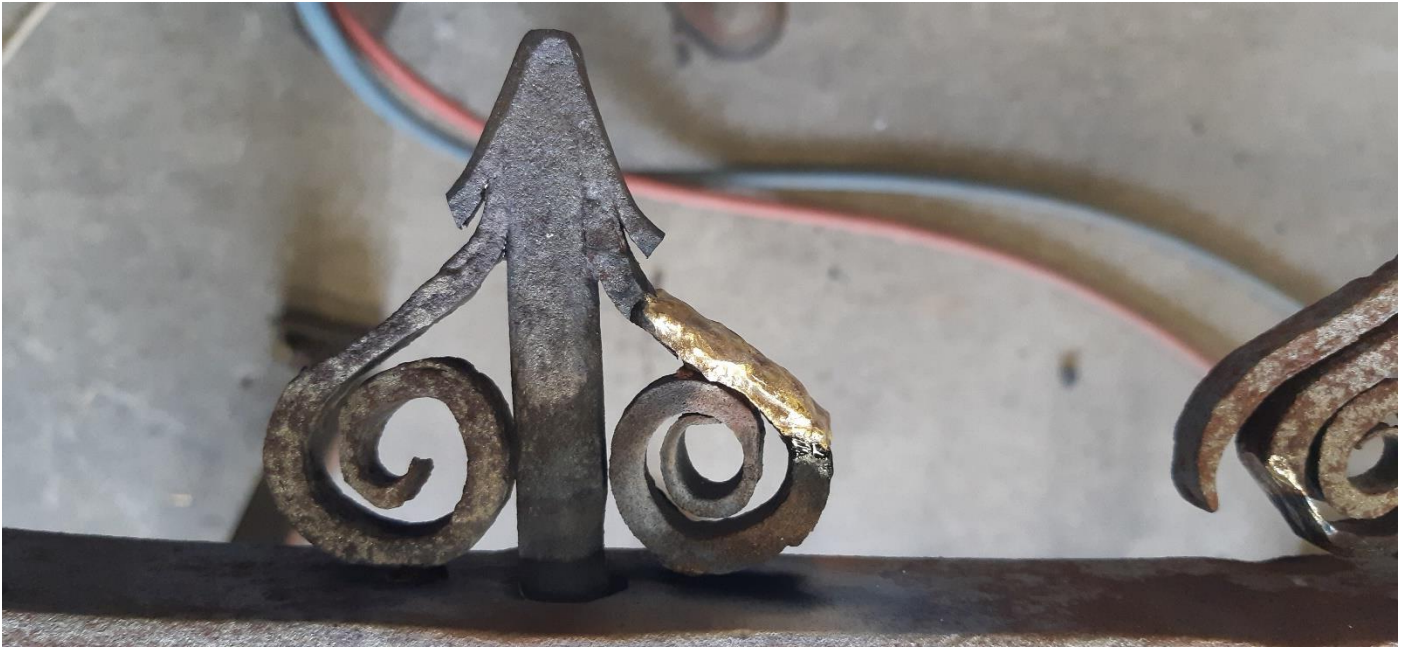
Stages in forging the scrolls



Ribbons and scrolls being arranged and fire welded to make a replacement finial



The stages in replacing the large scroll on the closing post. A new scroll is forged then brazed in the place of the old scroll using a gas torch. The brazed joint is then cleaned down and zinc phosphate primer brushed onto the bare metal.



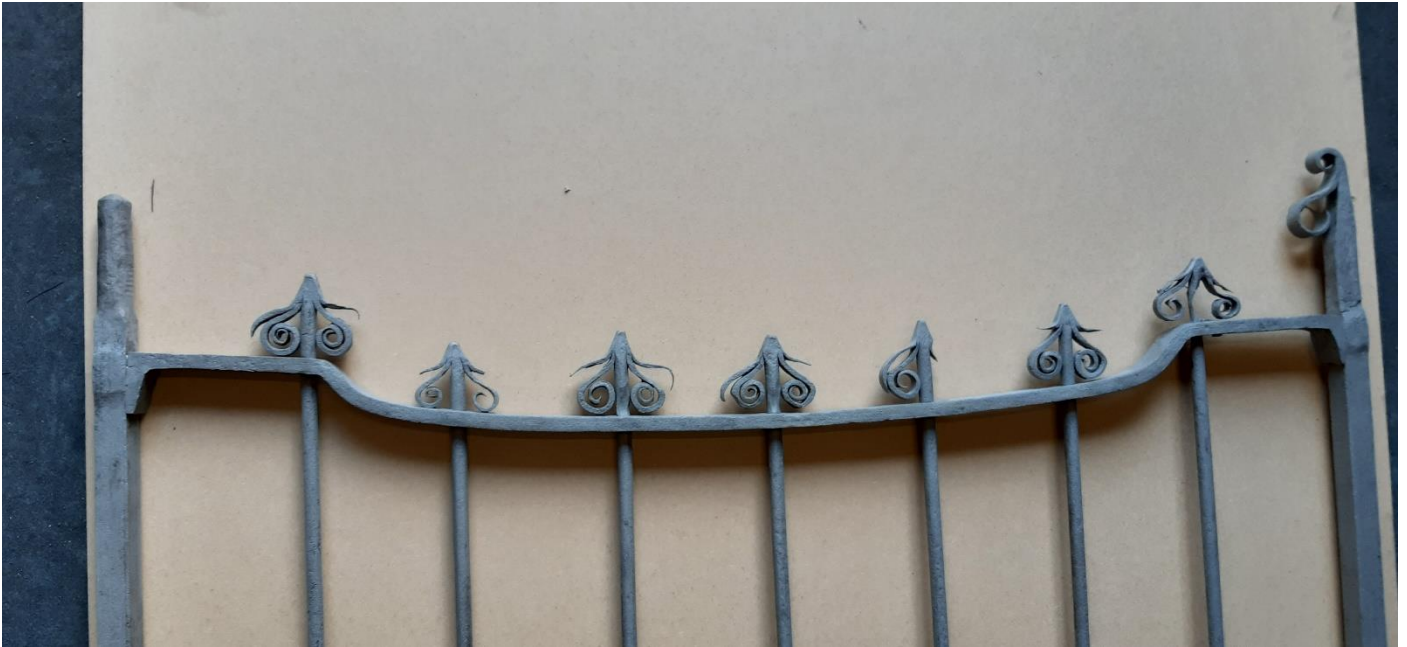
This finial has two of the old ribbons removed in readiness to replace with new ones. One of the scrolls was very thin but it was possible to save it by building up the thinned area by brazing and cleaning back.



Stages in repairing a finial with new components which were first fire welded together then brazed onto the upright.



Stages in repairing a finial



Before and after photographs showing all the repairs completed on the top row



Before and after photographs showing all the repairs completed on the middle row



A new rivet was made and installed to replace the old worn one on the latch



A new tenon was forged and installed to replace the broken one

Painting

When all of the repairs have been completed it is time for painting. The first step is to hand brush zinc phosphate primer into all the joints and nooks and crannies that are difficult to get into by spray painting.

After the hand painting is done, the gate receives two coats of zinc phosphate primer which are applied by spray painting.

The primer is then overcoated by spray painting two coats of finish coat which, in this case, was gloss white.



First coat of primer applied

Installation

The gate was then reinstalled in its original location.



Close up photographs of the installed gate

