Home Made Crucible and Tongs

By R.G. Sparber

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My crucible is made from 6” pipe with a ¼” thick wall. The bottom is ¼” plate. I can safely pour 9 pounds of aluminum in there and have 1½” from the surface of the melt to the lip.

The lifting studs started out as bolts but I turn the thread off where it is exposed so the lifting bar and pouring handle smoothly attach. The pipe was then tapped to accept the studs. Once screwed in, I plug welded them from the inside. In this way they will not unscrew. The spout was made from a piece of angle stock. In hindsight, it is a little small and I do occasionally spill some melt over the adjacent lip of the crucible. Note the steel block under the pour spout. This engages my pouring handle as will be shown later.

I really went nuts on the welding. The bottom plate is welded to the pipe with 4 beads of weldment. I did this mostly because it was fun. One bead would have been plenty.

To lift the crucible from the furnace, I use a double hook lifting bar.

Shadows at the bottom of the picture are a bit confusing but you can see that the top of my lifting bar has a T handle. I used ¼” CRS rod for most of it and the cross piece is 3/16” x 1” x 6” CRS.

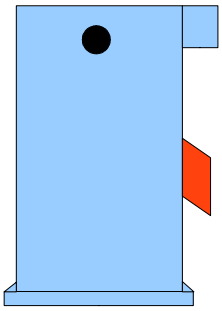
This is my pouring handle. It is made from 1/2” diameter CRS and ¼” x 1¼” CRS bar. My goal was to make it as reliable as possible so it does not have any moving parts to jam. The perpendicular bar is used to rotate the handle with my left hand as I support the bar with my right hand.

Tom Davis of the Valleymetal Club invented this handle and he doesn't even do foundry. Very smart guy and a true gentleman!

When this bar is fitted to the crucible and both are cold, it is a tight fit. However, when the crucible is hot, I get a loose fit. I had to do some quick adjustments the first time I tried to use this handle. The crucible's diameter increases about 1/16” when at 1450° F.

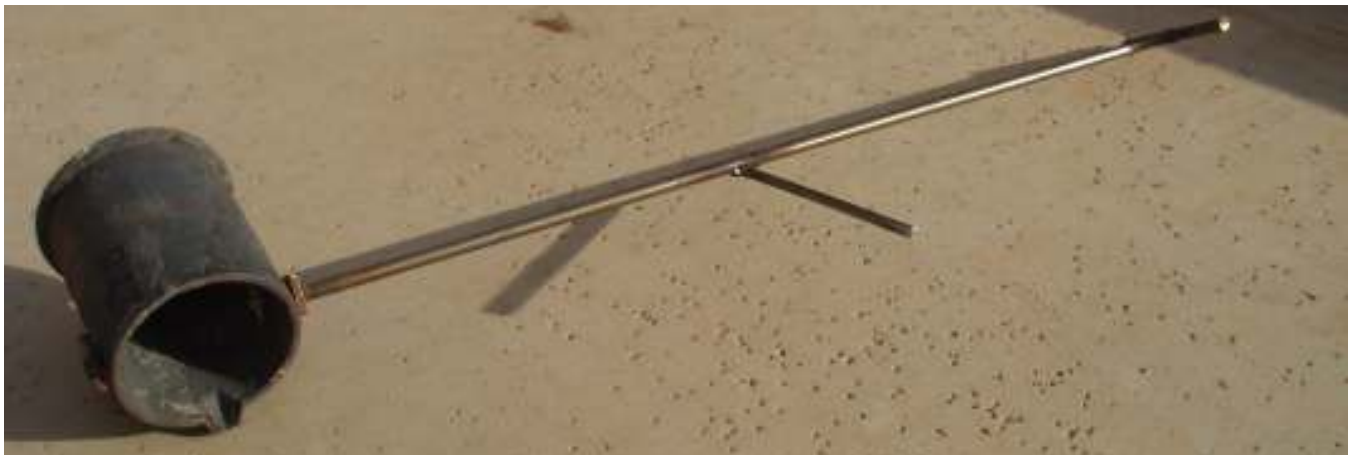
You can see how the handle engages the lifting bolts and the chock. For any reasonable position of the crucible, the handle is locked securely to the crucible.

The chock, shown in red, is



cut with a slight angle at the bottom so the upward force of the horizontal bar pushed the bar into the crucible.

Here you can see the “big” picture. I have used this handle over 10 times with a Visegrip® in place of the perpendicular bar and it worked fine. The last time I had my welder set up, I replaced the Visegrip with the perpendicular bar. I may need to shorten this bar a little as it may interfere with the action of hooking onto the lifting bolts.



During the pour, my left hand is rotating the perpendicular bar while my right hand is holding the handle closer to the crucible.

Before I use this equipment for the first time each day, it is all inspected for thinning of the crucible, cracks in the crucible, loose lifting studs, misalignment in the lifting hook, and misalignment in the pouring handle. When there is 9 pounds of aluminum in the crucible, it is no time to think about repairs.

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