The Ken Dettmer Side-draft Forge, Part II

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This is the second part of construction notes for Ken Dettmer's side-draft forge. Here, we describe the construction of the smoke chamber and the chimney.

Smoke Chamber

The smoke chamber is shown in figure 1. The side and back walls are double brick construction; the front wall facing the firepot is of single brick construction. See figure 2 for details. In part 1, we already mentioned the opening to the smoke chamber, which is 13" wide and 17" tall. The inside dimensions of the smoke chamber are determined by the width of the forge, the placement of the firepot and the thickness of the walls. Ken's forge is five bricks wide. Subtracting two bricks for the double wall construction gives us three bricks, as you can see in figure 2. Adding in the width of the mortal joints, we get about 26" for the width of the smoke chamber. Its depth is three bricks minus a brick and a half, giving us about 13", when including the mortar joints. The smoke chamber is 8 bricks tall, adding in the mortar joints, you get about 22 1/2" for the inside height of the chamber.

If you build a larger or smaller forge, you may have to reconsider the double wall construction. The chimney on Ken's forge draws really well, so you may want to stick close to the dimensions provided here. While the size and set-up of the forge may determine how well the chimney draws, you should know that a similar forge, somewhat smaller, has been built by Ken and some of his friends. The dimensions of its smoke chamber are very close to those described here and it draws equally well.

Figure 1: Smoke chamber

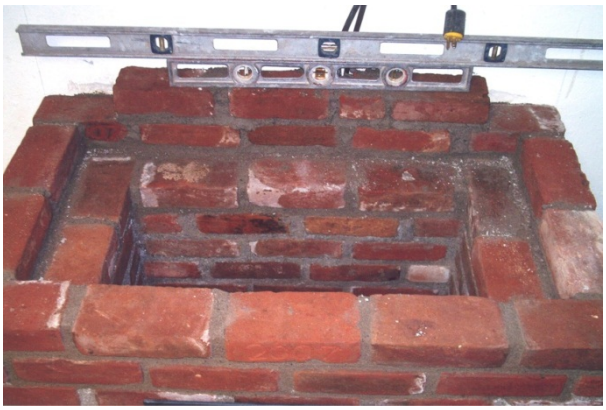

Figure 2: Double wall construction

Hood

In figure 3, you see the cage Ken welded up for the hood. It is welded from angle iron and round rods, but anything reasonable will do. The cage is placed inside the lip that you see in figure 2. This determines its lower dimensions which are 34" by 17". The top of the cage should be a bit over 12" square so that you can attach the flue to it. The height of the cage is determined by the construction of the hood. Ken wanted to overlap the bricks by 2/3 rds. This suggests a 60 degree angle. In Ken's case, the cage is about 8 bricks, or 20" tall. Notice that the back of the hood is

parallel to the wall. The angle in the front is determined by the other dimensions and will be greater than 60 degrees. The sheet-metal you see in figure 4 is placed onto the cage. The purpose of the hood is very simply to make it easier to lay the bricks; you just bump them up against the metal. As such, there is no need to weld the sheet-metal to the cage. Notice that at the base of the hood, you transition from two brick to single brick construction.

Blower Switches

The wires for the blower switches are run from behind the back wall through the triangular space created by the bricks lining the hood. All those triangular voids, including those for the wires, were filled with mortar. Switchboxes are placed on the row of bricks about to be placed on those you see in figure 4. Ken centered the boxes on the sides and had to cut bricks for them. Have a look at figure 1 from the first part of this article, to see the location of the switches.

Figure 3: Frame for the hood

Figure 4: Sheet metal on the hood

Chimney

The flue pipe attached to the top of the hood is 12” in diameter. Ken got his hands on some heavy grain elevator pipe. Alternatively, you can follow Jim Watts’ approach; he put together two pieces of 6” stovepipe to obtain a 12” diameter flue. The flue is welded to the top of the cage, as seen in figure 5. The pipe, just as the hood, is not strictly necessary, but it makes it easier to keep everything plumb.
Continue with single brick construction.

On the roof of your smithy, the flue needs to clear the peak of the roof by at least 4’. A rain cap should be 12” above the top of the flue to facilitate a good draft. For more information on chimney construction, see: http://www.beautifuliron.com/chimneys.htm

Figure 5: Flue attached to hood